

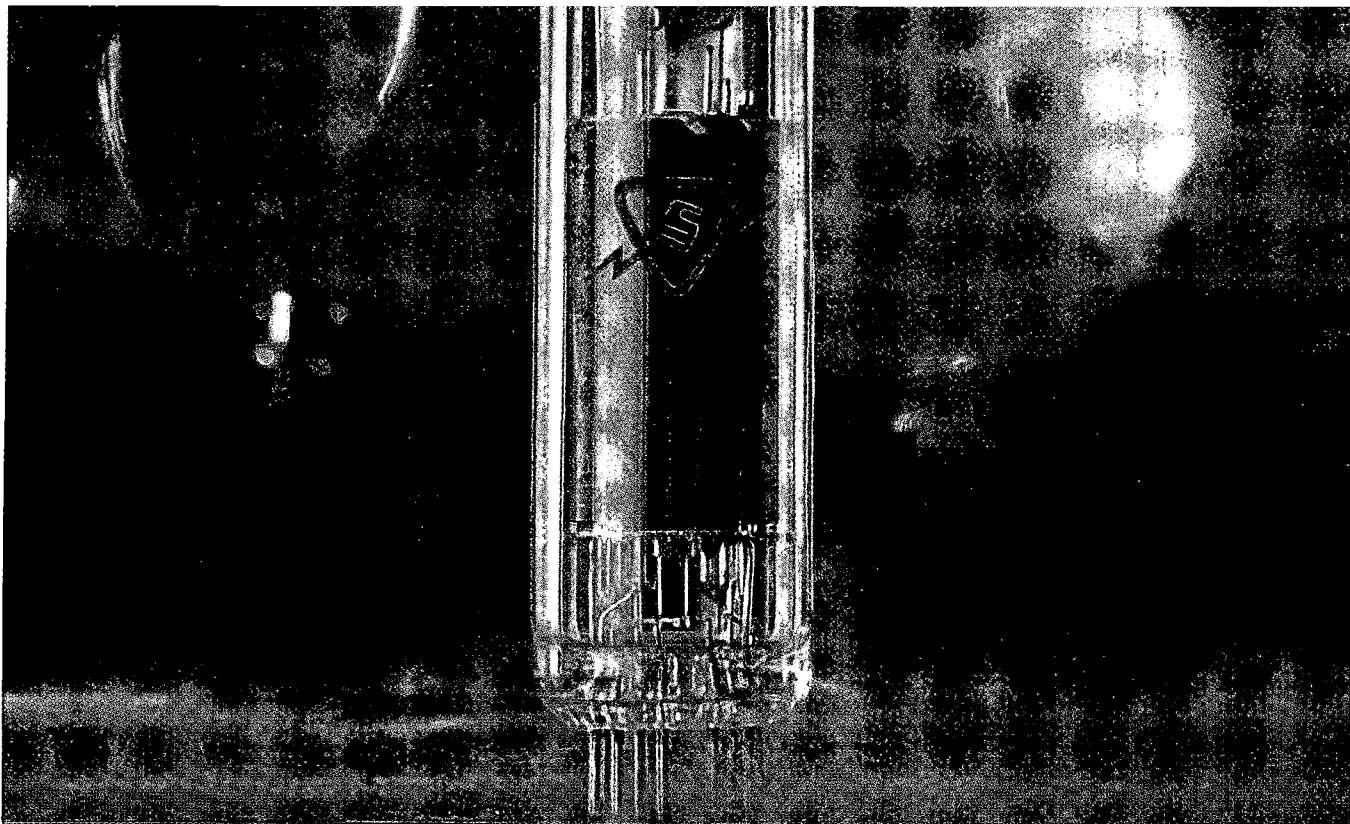
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SCIENCE FACT  SCIENCE FICTION

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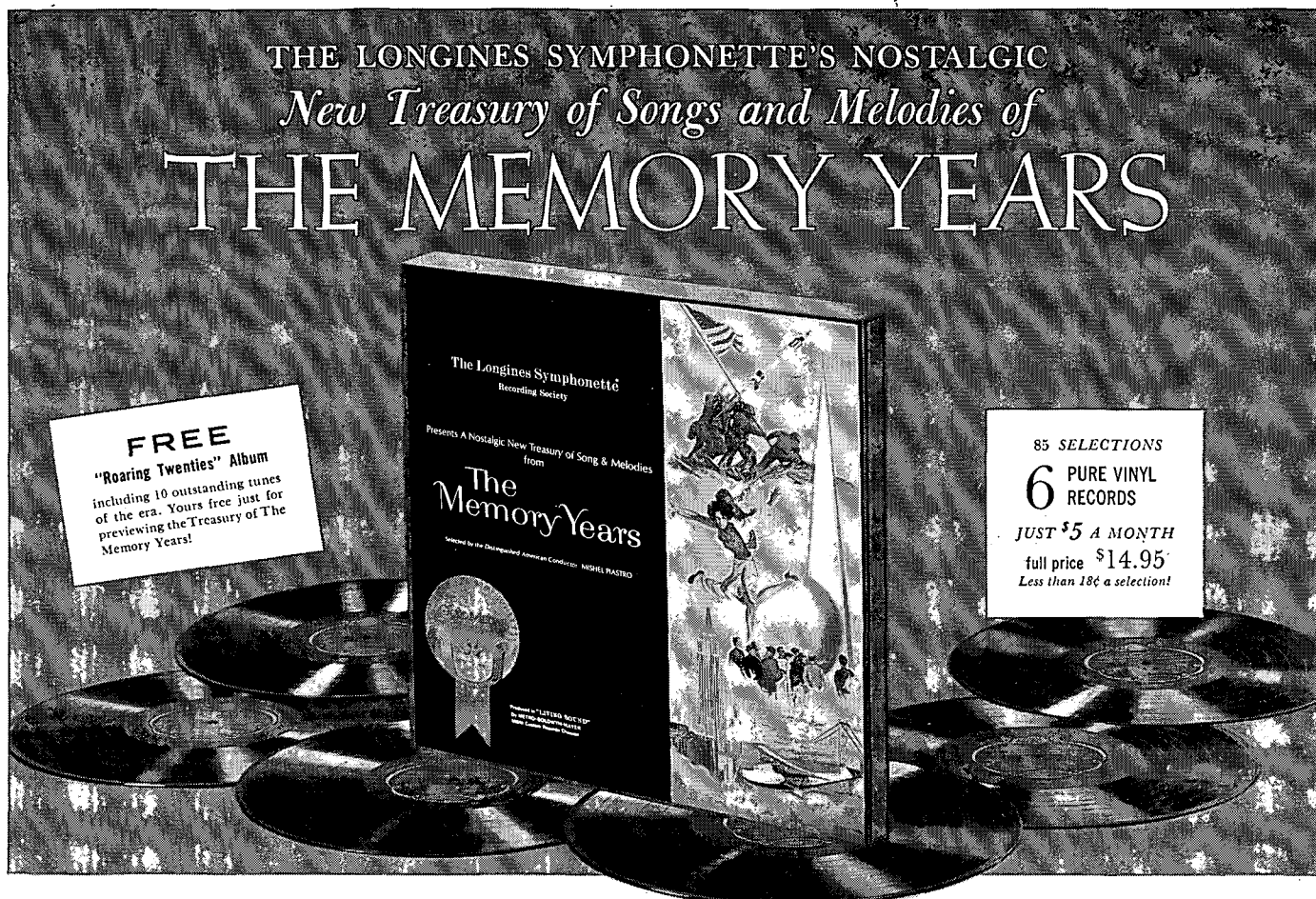
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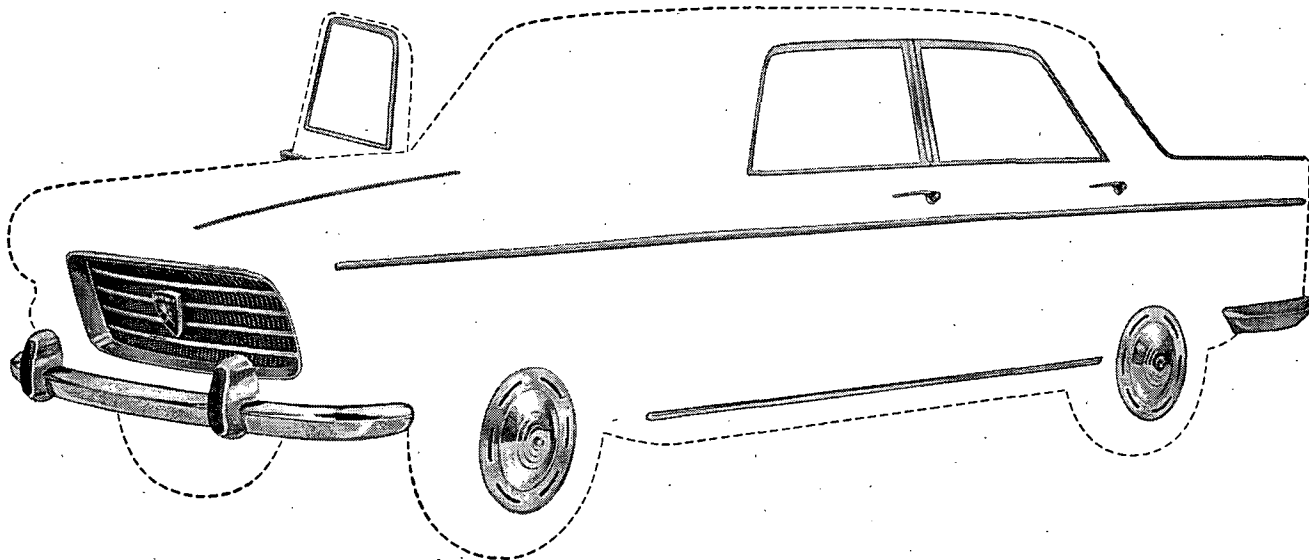
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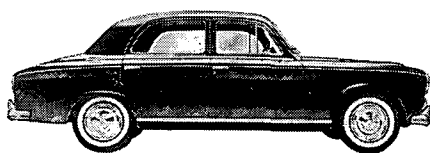
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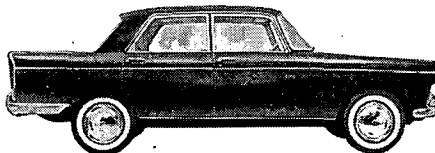
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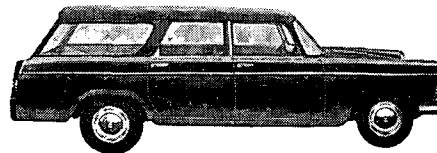
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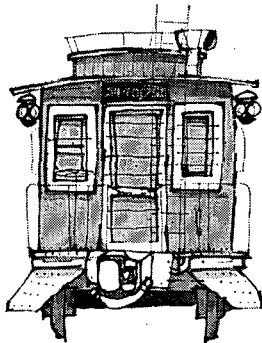
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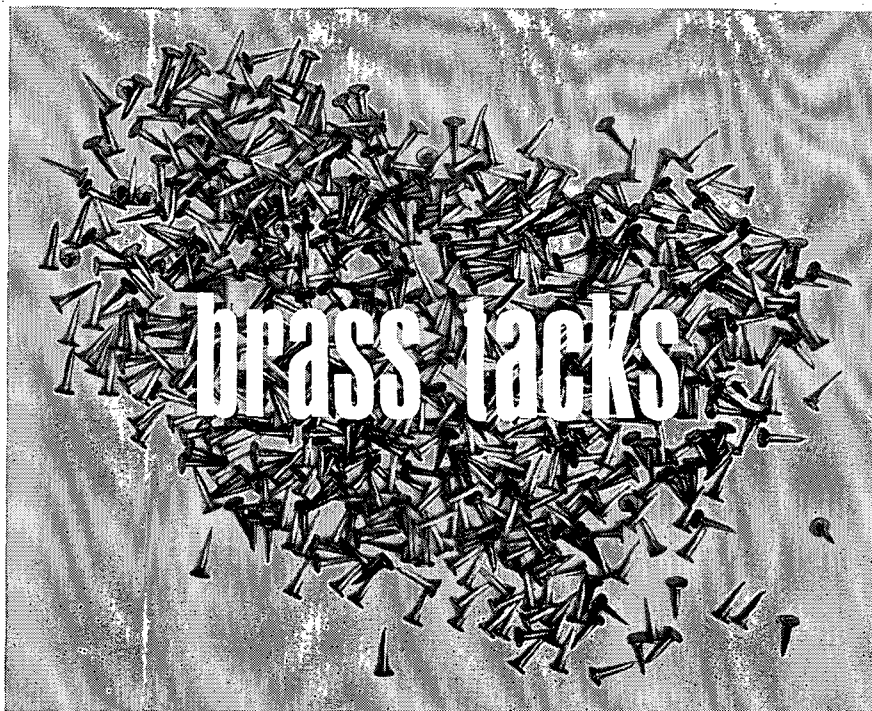
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COVER BY ROBERT SWANSON

OUR ENGINEERS NEVER RIDE THE CABOOSE



Sometimes an engineer can get so side-tracked in the course of a project that he forgets where it was going in the first place. This is calamitous. The engineer loses interest, and the wheels start to slow down in a dozen different places. / Hamilton Standard follows the project management concept, which enables the engineer to keep sight of the entire program, providing the "what and when" direction, establishing and maintaining responsibility for the "how" and excellence of work required to accomplish the programs. Specifically, the engineer will have the opportunity to participate in and pursue a program from the beginning to final production, including phases of / 1) Precontract — prepare R&D proposals, defining the tasks, technical as well as costs and schedules. 2) Planning — developing complete detailed plans covering each element of the contract. 3) Design & Analysis — creating the hardware ideas — applying the state-of-the-art, and assuming responsibility for the basic structure of the final product. 4) Development & Qualification — preparing development and qualification test programs to determine and demonstrate product performance, conducting these tests, evaluating results, solving the problem areas to assure complete product development and technical integrity, serve as technical consultant to manufacturing and maintain customer coordination, analyzing in-service or field product performance. / Some of the present projects involve space and life support systems, environmental conditioning systems, v/stol propulsion systems, micro-electronics, ground support equipment, turbine and rocket engine controls, industrial valves, electron beam machines, air induction and special controls. / Hamilton engineers are encouraged to broaden their personal capabilities by taking advantage of in-plant technical courses, lectures and seminars. Enrollment in useful short courses at various colleges and universities is also authorized. Engineers may also qualify for the company's rotational program. This provides opportunities for assignments in several departments to broaden the individual's knowledge of the company's scope of operations. / In summary: an engineer's future with Hamilton Standard is limited only by his ability and desire to make a contribution to the team effort — and his capacity to shoulder responsibility. He's got a wide-open track to personal progress. / We invite you to climb aboard for an immediate interview and to submit a resume of your qualifications to this equal opportunity employer. Write to Mr. A. J. Fehlber, Supervisor of Professional & Scientific Recruiting, Windsor Locks, Connecticut. Dep. A

Hamilton Standard DIVISION OF **United Aircraft**



Dear Mr. Campbell:

Your editorials are always intriguing, often irritating, but "Louis Pasteur, Medical Quack" in the June Analog is one of your very best. Your program of licensed quackery sounds fascinating, I'll be quick to apply for my license.

You leave the poor MD, however, still in the position of having always to be right in a field where this is virtually impossible. Making available a group of practioners who are legally irresponsible for their mistakes may drive the responsible doctors out of business. I think, however, that this aspect of the problem could be solved. Perhaps it would be best to have all routine medical care administered by computers.

Your exclusion of persons who have been committed to mental hospitals is, I fear, unrealistic. It would be nice to protect the public from insane practitioners, but some allowance should be made for patients who have been treated and recovered. The real answer to his dilemma, of course, is to find a cure for all the psychiatric diseases.

Thanks for the cerebral stimulation,
ERIC HOLMES, MD

While being a non-responsible practitioner would be attractive to the harassed M.D., the patients would prefer

the responsible type—which would tend to produce a balance!

Dear Mr. Campbell:

The June Analog was excellent. Analytical Lab ratings:

1. "Mustn't Touch," Anderson
2. "Undercurrents," (II) Schmitz
3. "Stuck," Berryman
4. "Dolphin's Way," Dickson
5. "Snap Judgment," McIntosh
6. "I, BEM," Richmonds

Anderson's story to me seems all too probable. I would attribute problems like this to the Heisenberg uncertainty principle, instead of a philosophical requirement of our natural constants (h , c , ...), but the problem will still probably be there.

I read somewhere that the hydrogen atoms producing the hydrogen bonding of the two spirals in DNA molecules normally "reside" at the purine molecule, but have a very small quantum-mechanical probability of "jumping" to the pyrimidine opposite it. Then the purine will act like a pyrimidine, and conversely, when the DNA strands separate and duplicate; thus one mutation technique. By altering Planck's constant—as in Anderson's story—the DNA—and RNA—molecules thus might have a higher probability of mutation, high enough that

the living organism affected would not retain the information carried on "how to reproduce certain cells"—i.e., the organism would die of "old age," a non-renewal of cells.

"I, BEM" was clearly a "message" story. Don't. I assume you used this story to fill in a few empty pages? I'll have to start writing, myself, if the supply is that low.

As a student physicist, I'm sorry that I missed the physical unreality of "The Permanent Implosion" re hydrodynamics. I was too busy enjoying it.

Thanks for that article.

Question: Why do all laws assume that men are children? That is, why must men be "protected" against their will from quacks? If a man goes to an unlicensed doctor for medical attention, "on his own soul be it." Also, if a man has a disease which is painful, fatal, and expensive to treat, why should he be prevented from such a course as suicide? Only expensive harm can be done his family by keeping him alive, in spite of his desires, for as long as possible.

The trouble with making the "quack" keep records: who will process them? We have a bad enough "information explosion" as is.

KENNETH W. RACHEK

115 E. North St.
Waverly, Ohio 45690

The "All men are children" aspect of our legal systems stems inescapably from the doctrine "I am my brother's keeper." You can't assume responsibility for your brother unless you also take authority over him. A parent is responsible for his child's welfare, and to make it work the parent must exercise authority. Precisely the same inevitably follows in a welfare state.

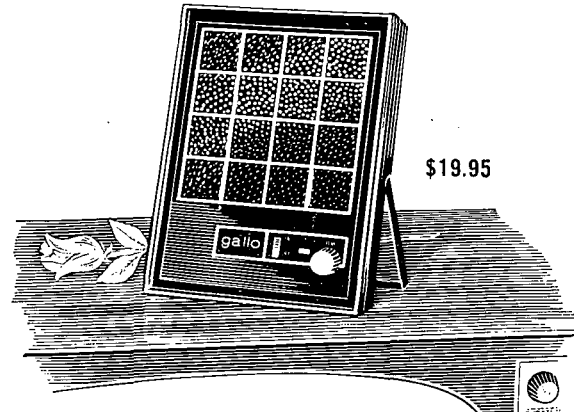
Dear Mr. Campbell:

Poul Anderson's "The Master Key" was as interesting a story as I have read in your magazine. I think Mr. Anderson may have taken off from ethnographic material concerning the Nuer tribe of Africa, or from some other society similarly structured around the so-called "segmentary lineage system"—a fairly unique complex

continued on page 92

BRASS TACKS

New!!! A TV-FM Antenna System that brings in every station, sharp and clear!



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The Gallo indoor system consists of multiple antennas . . . a low channel (2-6), a high channel (7-13), all UHF and FM channels...coupled to a stabilized broad-banded transistorized pre-amplifier. Perfect for color or black and white TV and FM monaural and stereo reception. Amplifier gain is nominally 20 db which clears up weak signals and boosts the overall performance of older sets.

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Completely omnidirectional the Gallo Mark III receives all stations equally well. Requires no positioning whatsoever! Find out what good reception really is . . . make the most of your equipment, install a Gallo Mark III today.

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the liquid world

Science of the Twentieth Century had made considerable progress toward a beginning of ordered knowledge—but a very spotty beginning. In some areas, excellent work had been done, and considerable fundamental understanding gained; in others that seem far less esoteric, little or nothing had been accomplished. By the middle of the century, scientists had done fairly accurate work in measuring the distance to other galaxies, determining the mass of this and other neighboring galaxies, and had measured the first-level atomic structural particles.

But they did not know what the life force was, nor did they yet distinguish between mind and brain.

And they knew less about the nature of the oceans than of the structure of molecules, little more than they knew of the structure of remote stars! At that time, they didn't know, even, the composition of sea water!

"THE HISTORY OF SCIENCE", CHAP. III,
GARGANOFF & O'SHAUGHNESSY,
CIUDAD DE MEXICO, 2432 A.D.

When the *Thresher* went down, it was definitely not the first naval vessel to sink in the deep waters of the Atlantic, beyond the shallows of the continental shelf. There were, however, several things that made the event distinctive.

The *Thresher* was designed to cruise comfortably at the depth of the continental shelf; it was one of the first of the really deep-water submarines. And only a year or so before the *Thresher* was lost in 8,500 feet of water, the bathyscaph *Trieste* had prowled around the bottom of the Pacific Trench in some 35,000 feet of water.

Within a couple of weeks, the *Trieste* was cruising around the spot on the bottom of the Atlantic where the wreckage of the pressure-crushed *Thresher* lay. The *Trieste* was quite at home in that relatively shallow water; the *Trieste's* extra-heavy plastic viewport had been replaced with a light-duty model for shallower work that gave a somewhat wider view.

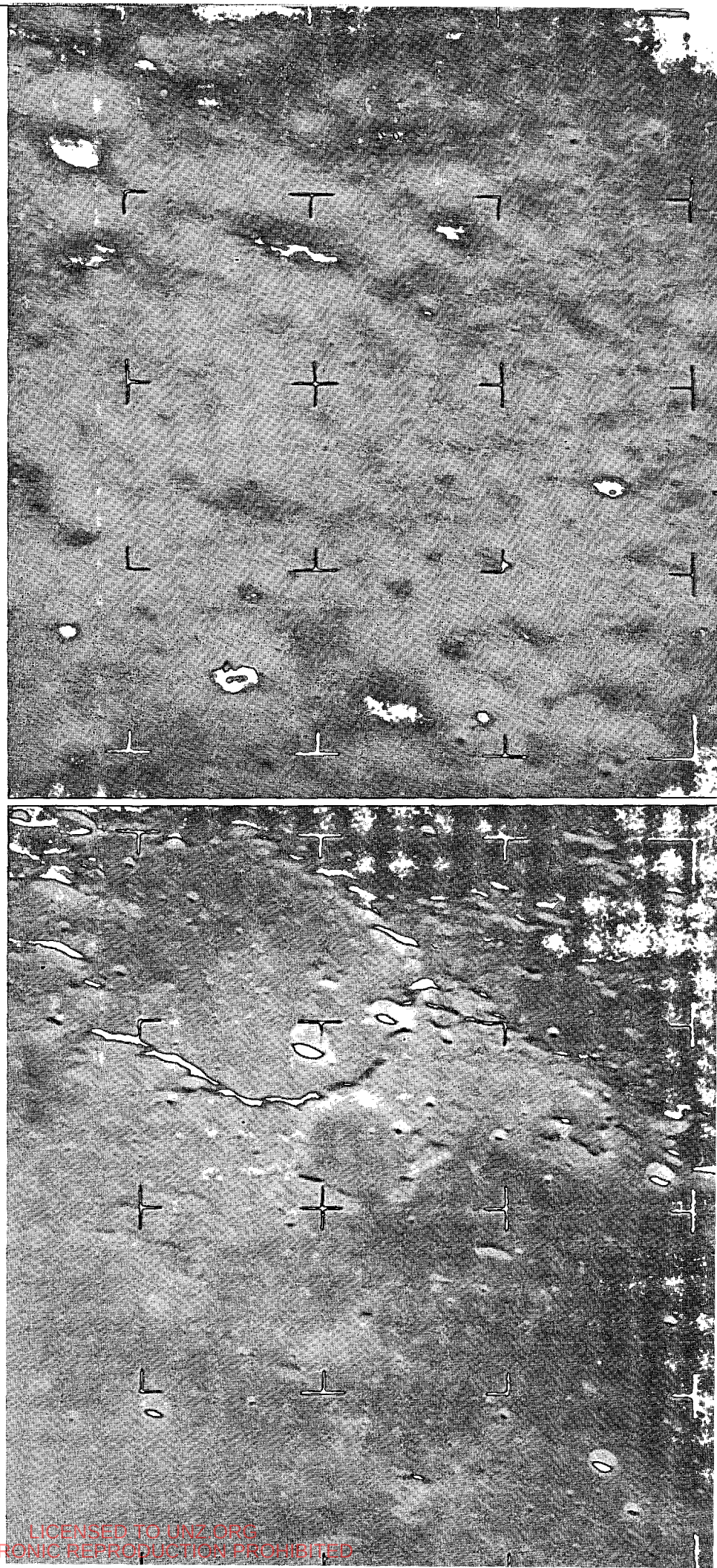
Continued on page 84

Ranger VII's magnificent success came after Dr. Jackson's article was already set; count this an added page! The achievement of Ranger VII is a full pay-off for the NASA Moon-study's 250 megabuck project; it sent back shots enormously superior to anything the previous six thousand years of observation had achieved. The detail visible far exceeds anything heretofore seen or photographed.

BUT . . . a detail shot of the Badlands area of Montana, if it were the only picture of Earth close up we had, might be somewhat misleading. And if the Moon is not the eternally static orb we've thought it to be, detail exploration not only in space—and the dry-land area of the Moon about equals all Earth's dry-land area!—but also in time will be needed.

Take a random-in-time shot of Vesuvius, and what's the chance you'll get a picture of an eruption? On Earth, we know there are islands that rise up out of the ocean, stay a while . . . and sink again.

470 MILES OUT 78 MILES 1.6 MILES 5 MILES OUT



*Whether the Moon's surface represents the result of
four billion years of volcanic upheavals unsoftened by weathering,
or an equal amount of meteor bombardment has seemed interesting but academic.
But now we're planning a landing on the Moon,
it makes an important difference—and there's colorful new evidence!*

INCONSTANT MOON | JOSEPH H. JACKSON

At 6:30 P.M., Mountain Time, on October 29, 1963, James A. Greenacre, an observer on the U.S. Air Force lunar mapping program, trained the 24-inch refractor of the Lowell Observatory, Flagstaff, Arizona, on the lunar crater Aristarchus, the features of which he had been painstakingly mapping since January. At 6:50 P.M., three reddish-orange and pink patches suddenly appeared in the vicinity of Aristarchus. Greenacre was dumfounded, for as an "impact" man he was firmly convinced that the moon is a dead place where nothing ever happens.

Impact theories, led by lunar authority Harold C. Urey and constituting the majority of American astronomers, hold that the moon was formed as a cold body, that its seas (maria) and craters were molded by the crashing of massive meteorites or asteroids, and that it has been the scene of little,

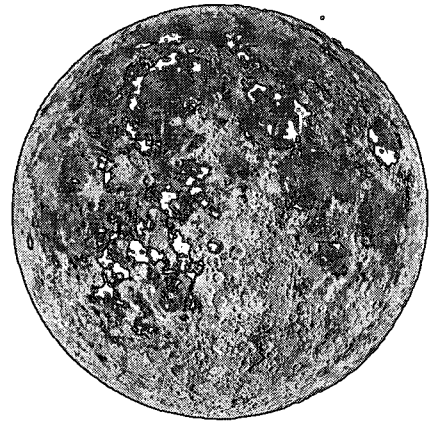
if any, volcanic or other activities such as have shaped the earth's surface. They are profoundly skeptical of the occasional reports of changes or activities on the lunar surface and tend to reject them out of hand.

For twenty minutes, Greenacre and his co-worker, Edward Barr, watched the distinct patches sparkle and grow brighter as small white dots appeared to flow along them. "I thought the motion seemed familiar somehow," Greenacre said recently in his slow drawl. "Finally it occurred to me that it looked exactly like the sign in front of a supermarket in Flagstaff—dots of red and white lights are chasing each other across it."

The two reddish-orange patches, one sparkling over an area of about 1.5 by 5 miles over a domelike structure and the other about 1.5 miles in diameter on a hilltop, appeared near the Cobra Head widening of Schröter's Valley.

The third spot, a pinkish streak about 1.5 by 11 miles in area, extended along the inner rim of the crater Aristarchus itself.

Observations of activities in Schröter's Valley have been claimed a number of times in the past. For this reason the British observers, H. P. Wilkins and Patrick Moore, wrote in their book, "The Moon," that "Schröter's Valley is, indeed, one of the most interesting formations on the entire moon." In the Nineteenth Century, F. von P. Gruithuisen and H. Klein had noted an occasional greenish color in the area. At the turn of the century, W. H. Pickering reported seven tiny craterlets in the valley, which he believed to be subject to periodic obscurations by whitish clouds or dust. He interpreted these as definite indications of a large active volcanic area. On February 10, 1949, using an 18-inch reflector in Norwich, England, F. H. Thornton



noticed "what seemed to be a diffused patch of thin smoke or vapor, apparently originating from the east side of the valley near Cobra Head, where the landslip is, and spread over the edge onto the plain for a short distance. Every detail of the valley was perfectly clear and distinct except where this patch occurred, but there the definition was poor and very blurred."

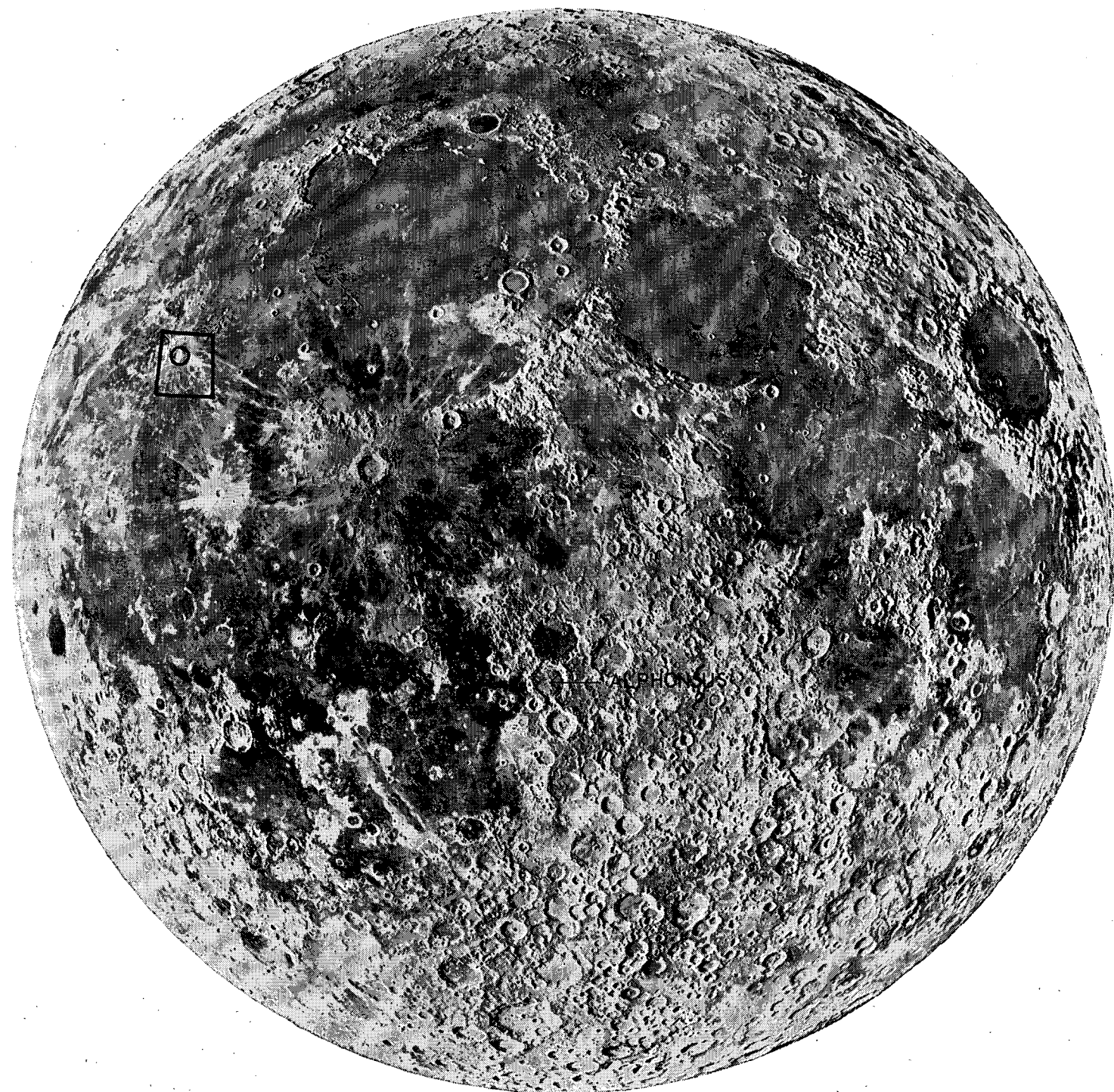
Greenacre's observations of "color phenomena," reinforced by subsequent events occurring on the night of November 27th have stood the skeptical astronomical world on its head and stirred the hopes of thwarted lunar volcanists, whose claims that the moon is one vast, globe-encircling volcanic field are usually met with raised eyebrows. Furthermore, the Flagstaff events may ultimately force changes in plans for Apollo and later lunar landings and exploration.

"My first thought was 'the Russians got there ahead of us,'" Greenacre continued. "Then I kept getting a sinking feeling—something must be wrong—it couldn't really be happening. After it's all over, you feel stupid of course, to think of all the things you could have been doing but didn't." It was just bad luck that the camera attached to the Lowell telescope had been left out of focus the night before. Knowing that it might take five minutes to focus it under the only fair seeing conditions at the time, Greenacre had to concentrate on visual observations, alternating with Barr at the telescope.

A most cautious and accurate observer, according to John S. Hall, the director of Lowell Observatory, Greenacre has not once mapped a feature in the region of Aristarchus that later had to be removed. The Flagstaff events have convinced him that "the

spots indicate some kind of activity on the lunar surface. They were not anything like dust or gas clouds but must have been something changing color on the surface." Greenacre's superlative skill plus his built-in skepticism make this rather laconic statement into one of perhaps historic importance.

On the evening of November 27th, Barr sighted two similar red spots in the same location while he was using the same 24-inch refractor, the instrument with which Percival Lowell had done much of his controversial work on the inner planets at the turn of the century. Barr summoned Greenacre, Hall, and a number of other observers to view the second "color phenomenon," which consisted of one 1.5-by 12-miles red streak on the exterior rim of Aristarchus and a small patch on a hill at some distance, very close to where the smallest spot had been noted on October 29th.



Location of observed lunar color phenomena in the region of Aristarchus (circle) in Lunar Astronautical Chart LAC 39, against the U.S. Air Force Lunar Earthside Hemisphere (north toward top in this and other illustrations, in the astronautical cartographic convention).

(opposite page at top)

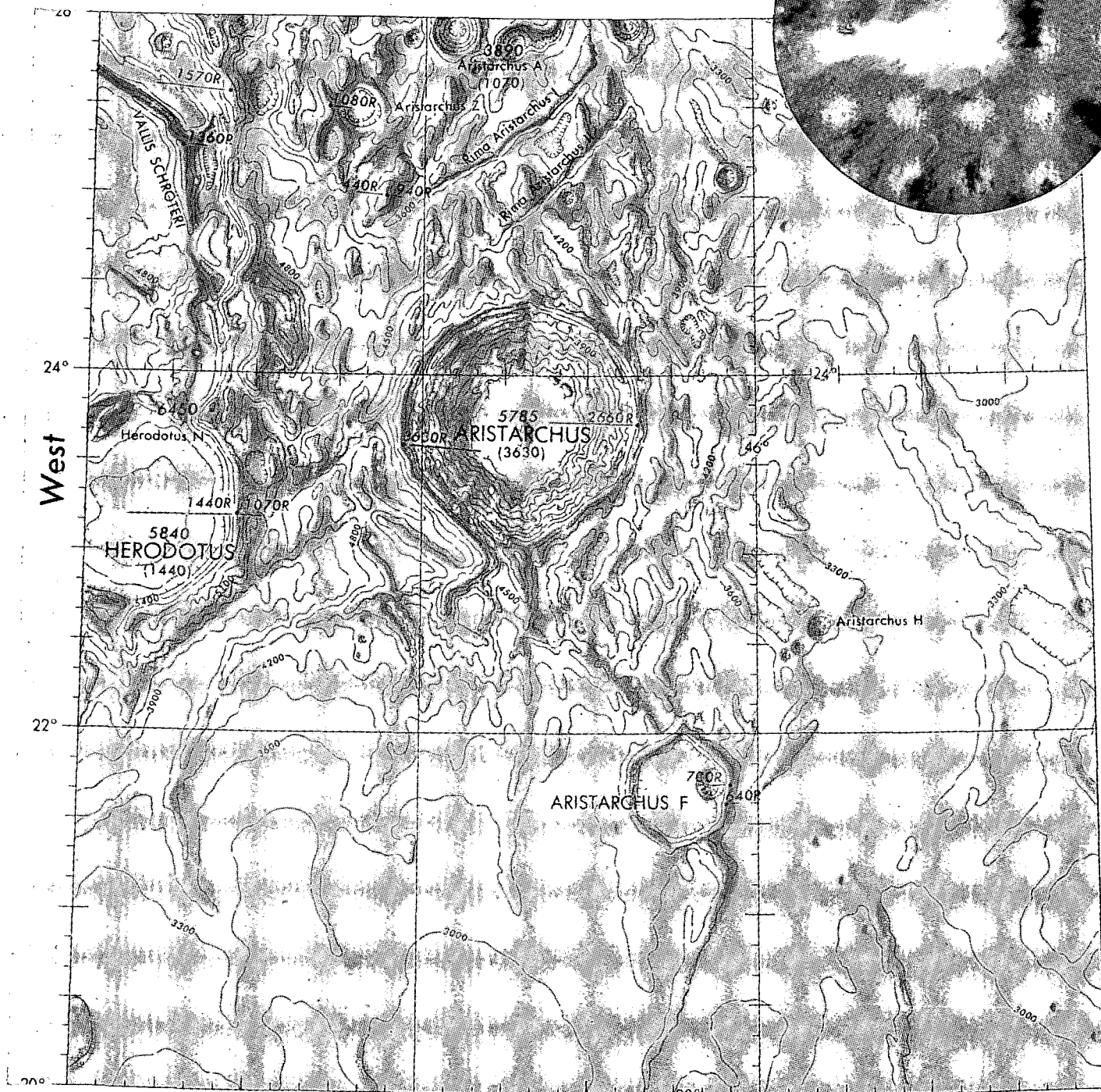
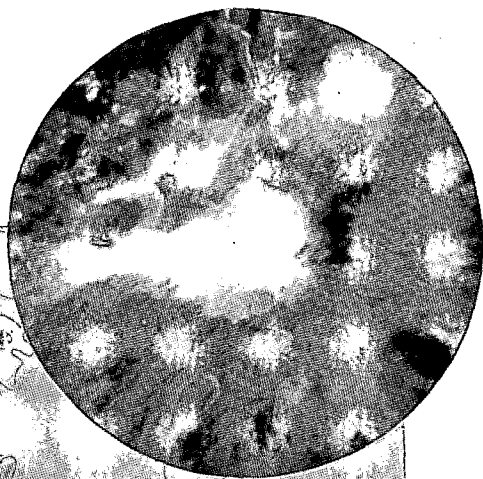
Brilliant Aristarchus and features in its vicinity under high illumination (120-inch reflector). (right) Details of region around Aristarchus from Lunar Astronautical Chart LAC 39 on which Greenacre was working (scale 1:1,000,000). Interval between contour lines is 984 feet (300 meters) and depth of craters from rim to floor is given in parentheses.

R is elevation relative to surrounding terrain.

U.S. Air Force Aeronautical Chart and Information Center

Inconstant Moon

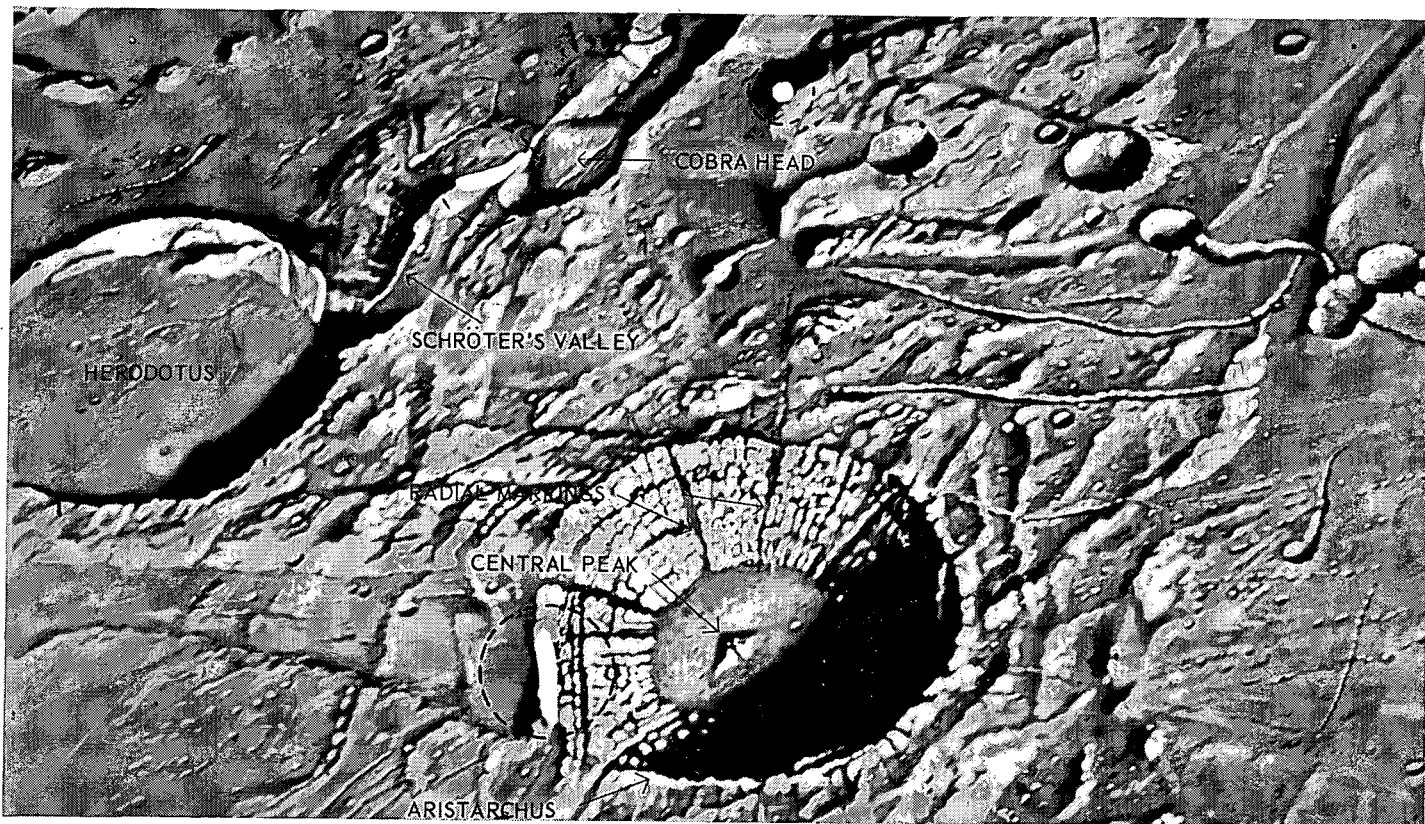
Lick Observatory,
Mount Hamilton, California



U.S. Air Force Aeronautical Chart and Information Center

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*Lunar color phenomena (outlined) observed October 29, 1963 at Lowell Observatory
(drawing by Patricia M. Bridges).*

The spots persisted for an hour and a quarter. Meantime, Hall phoned Peter Boyce at the Perkins Observatory in Flagstaff and asked him to look at Aristarchus with their 69-inch reflector, which would not give chromatic (color) aberrations as the refractor might. Boyce confirmed the existence and location of the red streak. This time several bursts of black-and-white photographs were made, but the patches did not appear on them, and in fact could not be seen with the 12-inch guiding telescope attached to the

larger one.* Color film has now been tested and readied to record any future patches.

To add to the mystification, the U.S. Air Force report, which was finally published in May, noted that about three hours after both events "violet- or purple-blue colors," which partially covered some familiar features, were observed forming and spreading around the rim and within the crater of Aristarchus. The report explains, somewhat obscurely, that "this portion of the observations has not been published for various reasons, the most important being that there is doubt as to whether they are a part of the red phenomena." It adds rather freely, to the delight of lunar volcanists, that such a haze "has been reported by numerous observers in and around Aristarchus and other craters for many years," and documents some of them. A recent run-down totted up sixty events reported in Aristarchus, of which twenty-five had been fairly accurately dated and described. To top it off, Aristarchus is far and away the

most brilliant point on the moon, brightly apparent even when it is lit only by earthlight during lunar eclipses.

In 1931, a British astronomer, Walter Goodacre, reported a bluish glare on the west wall of the crater Aristarchus just after sunrise; the same glare was noted by other astronomers. In 1945, H. P. Wilkins observed a "bluish glowing of streaks on floor—Aristarchus crater—and a mountain mass delta." The American astronomer, Dinsmore Alter, noted in his observing log book in 1959: "Visual—Interior of Aristarchus is a light brilliant blue!! Later in night it was white again. The observation was made with the Mount Wilson 60" and a power near 700. Seeing was only 2."

Were any spectrograms attempted of the longer second-color phenomena of Aristarchus, or of the bright hazes? There may not have been time, of course. But this is just what Soviet astronomer, N. A. Kozyrev, of Pulkovo Observatory, Leningrad, did on three

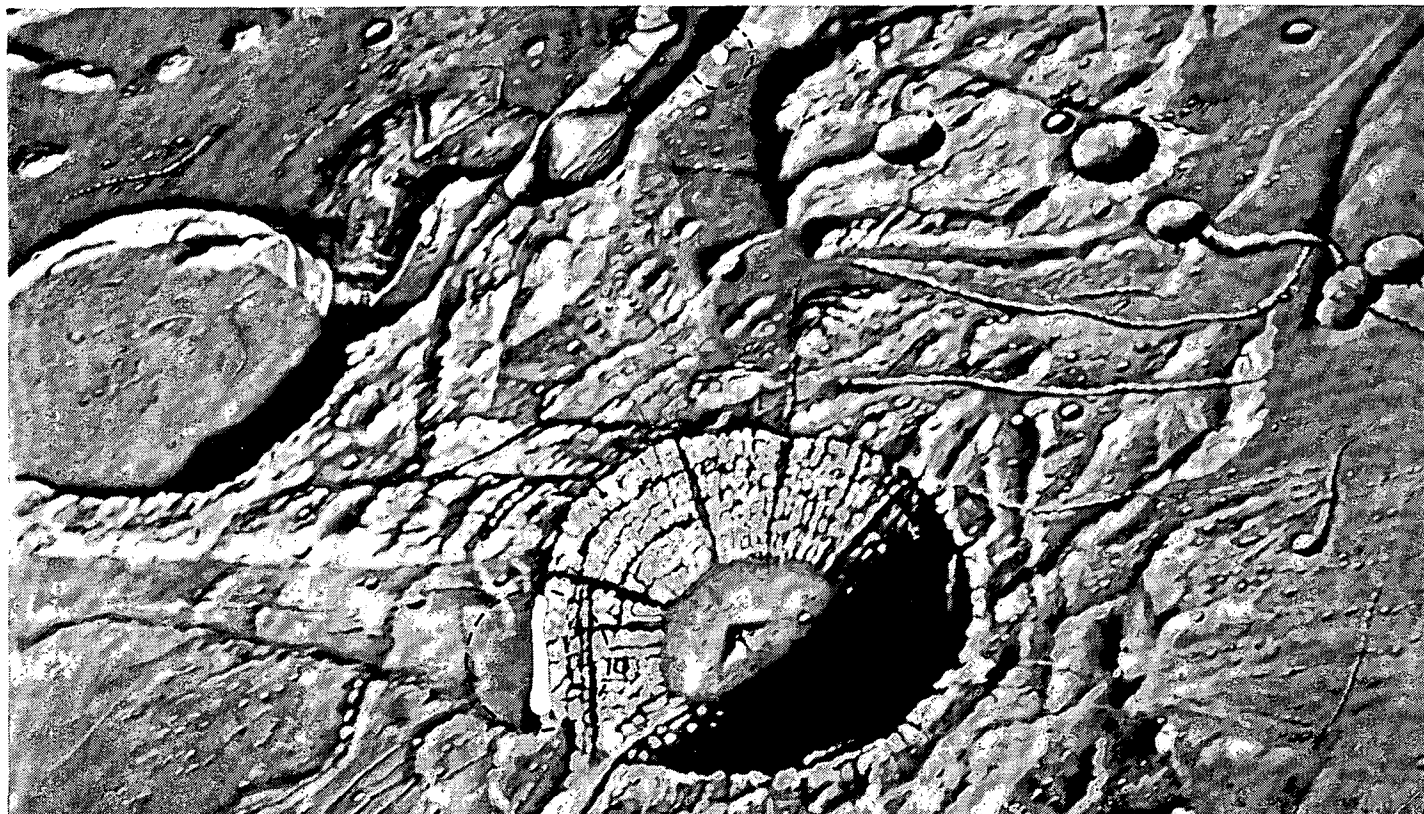
***Footnote**

The human eye is a remarkable device—and therefore produces confusing results sometimes. The moon is a landscape in full sunlight—correct exposure for a photograph of the moon is about 1/250th sec. at F 8.0 with ASA 100 film, for instance. But when it is magnified 700 diameters the illumination is reduced by 49,000 times; it becomes a dim scene. In low light-levels, the eye shifts from full-color vision to black-and-white vision, for increased sensitivity—without much conscious warning.

It may well be that the color phenomena are too dim for human vision with a "small" 12-inch telescope, but that the greater light-gathering power of the 24-inch and larger scopes raise the illumination at the retina of the observer's eye above the color-vision threshold, and allow perception.

In that connection, it's worth remembering that the major telescopes—200-inch, 100-inch, 72-inch, etcetra—are used almost exclusively for deep-space research on stellar spectra and the like. They are very seldom turned on the moon, and even more rarely used for visual observation of the moon.

If the color phenomena are at the threshold of vision with 24-inch telescopes, it's not surprising it hasn't been observed very often. The Editor



*Lunar color phenomena (outlined) observed November 27, 1963 at Lowell Observatory
(drawing by Patricia M. Bridges).*

occasions in 1961 when he saw "brightenings" in Aristarchus. The spectral bands he obtained convinced him that hydrogen gas had been issuing from a cone within the crater. Russian astronomers have usually subscribed to the volcanic theory. If it should turn out to be correct, we will have literally to stay up nights catching up with their extensive lunar geological analyses.

Were any contrasting blue-violet and infrared photographs made of the purple-blue hazes of Aristarchus? Normally, infrared light will slice much further through veils, fogs, or hazes than blue-violet light of shorter wave lengths. If a plate taken in infrared light shows less fuzziness than one of the same area taken in blue-violet light, the infrared light has obviously penetrated something. Using the 60-inch Mount Wilson reflector, Dinsmore Alter made such photographs of the lunar crater Alphonsus in 1956 and found that certain crater-floor features looked more fuzzy on the blue-violet plates than on the infrared. At the time, this

photographic evidence of some kind of obscuration or "degassing" on the moon warmed up the then lukewarm interest in the issue of lunar activity.

Alter subsequently obtained photographs of similar obscurations around Linné on the western side of the Sea of Serenity, drawn by early lunar cartographers as a deep crater four to five miles in diameter. In the 1860's the crater seemed to have vanished and a small whitish hill or dome had taken its place. Whether Linné had ever been a crater or not became a very tangled controversy. In 1961 and 1962 a number of observers noted that Linné looked very much like a distinct crater on occasion, then later returned to its normal aspect. It is urged that under certain conditions of lighting the slopes and shadows of Linné are such that it gives the false impression of being a crater; this may have been what the early observers saw. Now Linné is indubitably a ten-mile, light-colored mound with a tiny hole in it. A small dark craterlet near the crater Birt by the Straight Wall in the Sea of

Clouds also appeared to Alter to be obscured in some photographs.

Alter remarked of his Linné photographs that "If you compare the difference in the crest of that 10-mile mound with the difference between the other features in the two photographs, you will agree it's too great. To me that suggests the possibility of additional atmospheric obscuration in the immediate area of Linné, which in turn suggests gas seepage there. But that's something each of you will have to decide for himself."

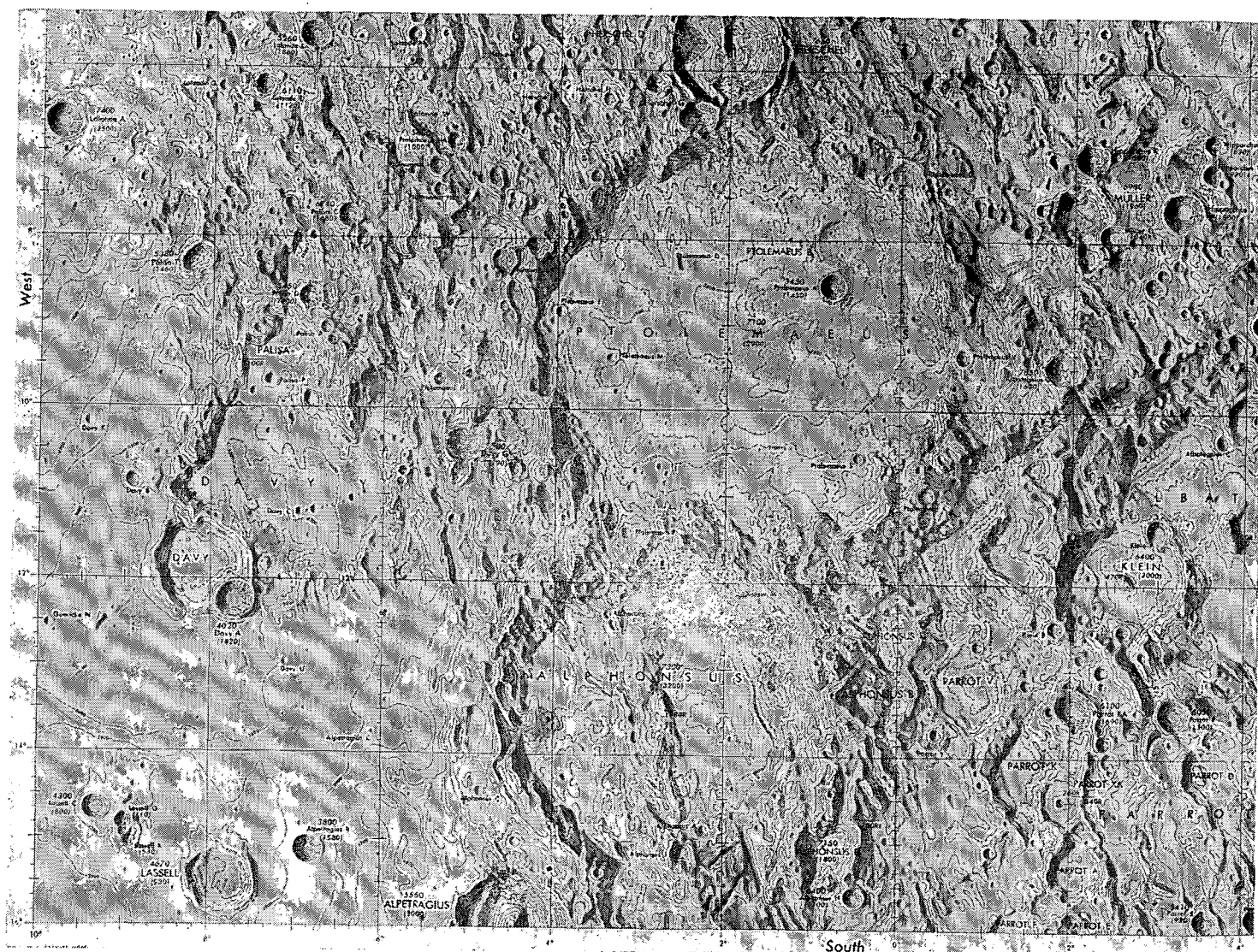
Some astronomers agreed with Alter. Most could see no more than variations in resolution over the whole face of both photographs, caused, they thought, by terrestrial atmospheric effects. But in 1963 Alter wrote that he must "plead guilty to a stubbornness which forces me to remain one of the minority who believe that, despite the great importance of meteoritic impacts on the moon, its internal conditions have been even more important in producing the surface we observe today."

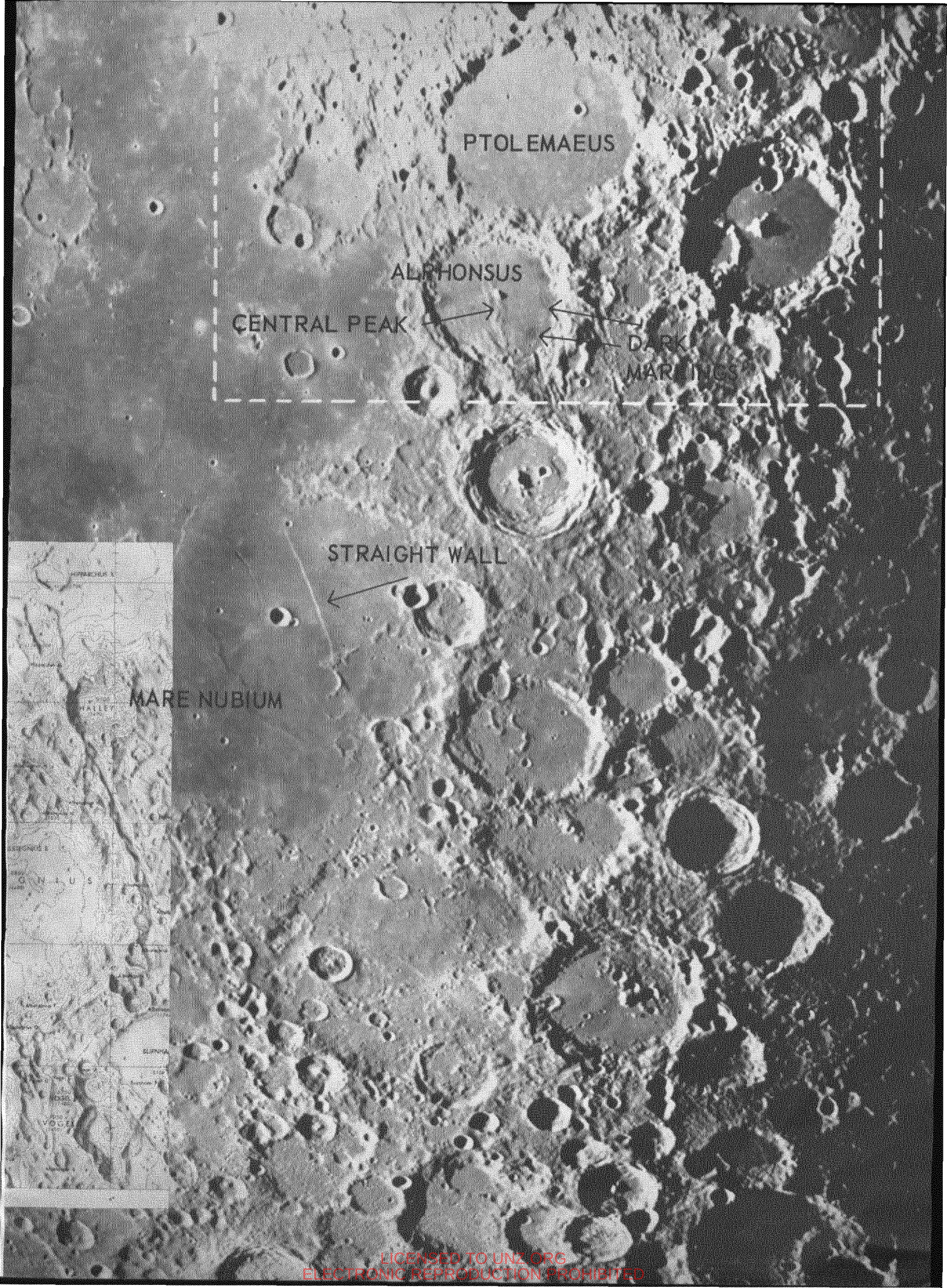
The British astronomer, Patrick

Inconstant Moon

(right)
*Alphonsus crater and features in its vicinity
in the south-central region of the moon (100-inch reflector):*
Mount Wilson and Palomar Observatories

*Details of Alphonsus region from
Lunar Astronomical Chart LAC 77 (scale 1:1,000,000).*
U.S. Air Force Aeronautical Chart and Information Center





PTOLEMAEUS

ALPHONSUS

CENTRAL PEAK

DARK
MARKINGS

STRAIGHT WALL

MARE NUBIUM

Inconstant Moon

Moore, at the New York Academy of Sciences' conference on geological problems in lunar research in New York in May 1964, underlined his belief that "volcanic forces played the main role in the molding of the lunar surface." To illustrate his point he displayed a photograph filled with realistic craters, craterlets, and domes—then confessed that it was simply a picture of a pot of boiling porridge!

Stressing the difficulties that confront lunar observers, Moore said, "In my thirty years of studying the moon, I've only seen one event on it of which I'm certain, and that was really a case of *not* seeing something. As a youngster using a very small telescope, and really inexperienced, I was sure I saw light spots in Schickard, a large walled-plain near the edge of the moon's face. Others have reported spots or mists there, too, so maybe I did see them, but I don't claim it now. I am certain, however, that one night a number of craterlets in the floor of Plato weren't there where they should have been. I didn't see any distinct haze or anything moving—they just weren't there. Explain it if you can."

Moore has helped to confuse the issue by attributing the "color phenomena" in Aristarchus "to some kind of colored surface deposits, possibly on slopes, visible only under certain conditions of lighting and libratory wobbling of the moon." Hall has also commented that "It is perhaps significant that all four Lowell sightings were made less than two days after the Aristarchus neighborhood emerged into the sunlight." The sunlight might perhaps have simply made the patches visible or caused certain types of material to luminesce.

Many features of certain lunar craters and seas have been pointed out that indicate that volcanics have played a part in the shaping of the moon. The placement of the larger craters and their shapes appear to be related to the grid of surface fractures and faults,

rather than being randomly scattered about the moon's face, as meteoritic craters would be. There are many chains of craterlets on the moon, and craterlets are often nested within larger craters as they are in terrestrial volcanic areas. Further, the rims of craters come right up to those of craterlets on them, whereas it would seem that hypervelocity impacts would have devastated the rims where meteorites struck. At least fifty tiny holes have been discovered on the peaks of sharp crater cones or central mountains, which meteorites could hardly have drilled so neatly by chance.

After Alter had announced apparent obscurations of portions of its floor, Kozyrev became interested and began to make routine spectrograms of the crater Alphonsus. In November 1958 and October 1959, he obtained spectra which he interpreted as indicating the outflow of gases, a lava stream, and a cloud of volcanic dust from Alphonsus' central peak.

After the first event in 1959, a tiny red patch on the south side of the central peak of Alphonsus was seen by a number of observers. Among those reporting this new spot of color were G. A. Hole, H. P. Wilkins, and B. Warner in England and several observers in Hungary and the United States. Wilkins saw the patch as roughly circular, with a black spot in the middle and red-colored material mounted around it. However, others who searched for this patch, even with large instruments, could not see it at all. As described, it sounds remarkably like some of the color phenomena in the vicinity of Aristarchus.

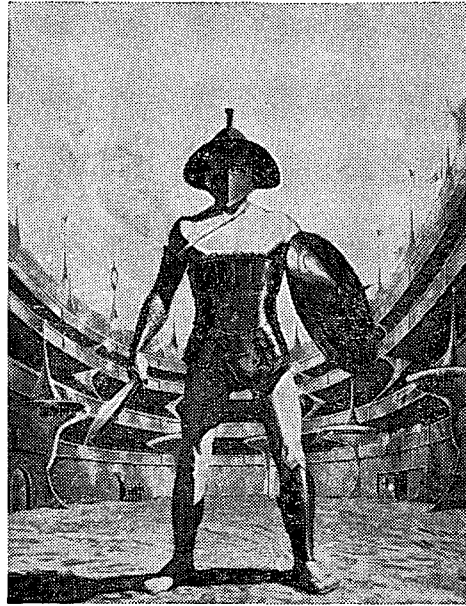
In 1961, Kozyrev reported that his spectra of the center of Aristarchus definitely indicated the emission of molecular hydrogen gas from the moon's interior. The luminescence revealed by the spectra of Aristarchus and its vicinity, he also claimed, was much too intense to have been produced by solar-wind particles or by solar radiations, as some have suggested. He concluded that "volcanic processes on the moon, observed so often, show that it has internal energy that can be no less than the internal

energy of the earth." He firmly believes that "the history of the formation of the lunar landscape may, in fact, be mainly the history of the internal processes of the moon's cosmic existence; while external influences may have been of secondary importance and, in particular, the role played by meteorite impacts scarcely more significant than in the formation of the known terrestrial features."

The heads of the impact people are bloodied but unbowed from the blows of this mounting, substantial evidence. Fred Whipple, director of the Smithsonian Institution's Astrophysical Observatory, expresses the essence of the impact view in writing that "Within a dark lunar cave there would be eternal silence and inaction excepting possibly moonquakes. A spider web across a dim recess in such a cave would remain perfect and unchanged for a million years."

The American astronomer Ralph Baldwin marshaled solid evidence in the 1940's that many lunar craters were formed by impact. He discovered a definite relationship between the depth and diameters of the pits blasted out by terrestrial mines, shells, and high explosives and those of the larger lunar craters—they appeared to follow the same strict mathematical expression, although it has been pointed out that there is a considerable spread in the data. The formation of some of the great lunar craters like Copernicus, Kepler, and Tycho has been analyzed in detail by scientists like Eugene Shoemaker of the U.S. Geological Survey and similarities to nuclear explosion craters at the Nevada testing site pointed out—even the star-shaped rays extending radially from the lunar craters are faithfully repeated in Nevada. The debris thrown out by impact and the patterns of secondary, peripheral craters created around the primary ones have been studied and explained, and the contrast with the effects of volcanic eruptions has been underlined.

Lunar volcanologists were on the offensive, however, at the lunar re-
continued on page 81



SWEET DREAMS, SWEET PRINCES

Mack Reynolds

Part I of III. With two opposing sides, you usually get war. With three, however . . . you get confusion running rampant! Then we start playing "Doctor, doctor . . . who's got the doctor!"

The amphitheater covered an area of some six or seven acres. Overall, it measured slightly more than six hundred feet by five hundred feet, but the arena itself, the fighting arena, was two hundred eighty feet by one hundred seventy. There were comfortable seating facilities for approximately fifty thousand persons, but on an occasion such as this—national games—they could, and did, pack in as many as seventy-five thousand spectators.

There were those who disgustedly contended that the place was just too confounded large. That a fan in the upper tiers of seats could hardly make out individuals in the fights below, could certainly not follow the more delicate nuances of the combat. Be that as it may, the arena never failed to play to a packed house—a packed and over-packed house. Ultimately, those who were

allowed to buy seats were chosen by lottery, and it was figured that you had one chance in a hundred of winning an upper-tier place; one in a thousand of actually getting one along the podium.

This was the final day. The play-off, so to speak. Whether or not the arena had been packed over the past week, it was overflowing today. As he looked up from the shade of the recess behind the Portal of Life, preparatory to the grand parade, Denny wondered briefly how many of those, squeezed tightly in aisles, sitting on steps, jammed into the area supposedly to be utilized exclusively by the band, had got in through bribery or other trickery. He had heard that tickets were being blackmarketed. That scalpers were getting as much as a month's income for even upper-tier seats. He had even heard that one brave entrepreneur had forged tickets, a hundred or more of them, all for the same choice seat, one located within a few yards of the Master of the Games, and had made himself a fortune, before, by almost impossible coincidence, approaching the bearer of the real ticket.

Denny was hardly happy about the situation confronting him. He'd had the good luck to survive thus far, he'd had the bad luck to draw the equipment of a Secutor. He was fully aware of the percentage. The cognoscenti would offer odds of five to three in favor of a Retiarius against a Secutor, all other things being equal. And all other things were equal today. Yes, he'd survived the week. Here he was on the last day of the games. That meant a good deal. However, he cast his eyes to right and left, so had all the rest of them lining up for the parade, half of them equipped as Retiarii, half as Secutores.

As a Secutor, his equipment consisted of a breastplate, helmet and armor on his right arm and his left leg, the left arm and right leg were left bare for the sake of agility. He bore a shield and a sword and was considerably less mobile than a Retiarius who was equipped solely with a net and a trident. That was where the disadvantage lay, the weight of his armor hampered his mobility.

He cast his eyes back over the rest. Twenty-four of the most excellent physical specimens in the land. Half Secutores, half Retiarii. And within the hour, at least half of them would be either dead or *hors de combat* as a result of wounds.

The Secutor next to him growled, "When's that con-founded band going to begin to play? I'm getting worn out just carrying this tin shop."

A Retiarius behind them laughed. "In that case, I hope we stand here a couple of more hours."

Denny looked at the Secutor who had complained, and recognized him. From time to time, during the week of games, they'd been thrown together. The day there had been a mock battle between the Macedonians and the Persians, they had stood side by side in the Macedonian phalanx. And the day of the chariot fights, the other had been his charioteer and a good one, too; the casualties taken by both sides that day had been brutal, but they'd managed to survive.

Denny said now. "Last day, Zero. Good luck. I hope you make it."

The other looked at him. It was hard to make out features through the helmet slits. He said, "Denny, eh? Same to you. But it's going to be rugged. The first day and the last day are the worst. That gong won't ring until half of us are sprawled out on the sand, a full half of us."

The band struck up a lilting marching tune. One of the assistants to the Master, said, "All right, lads, let's go. Make this a good one, the crowd wants action."

"Care to join us, you fat funkier?" Zero growled at him.

They swung across the sanded arena floor, marching in perfect order, in perfect time to the music, and deployed before the judge's stand and the Master of the Games. He was flanked today by prominent citizens, both male and female, whose polite applause was drowned in the shouts of the multitude in the stands.

The Secutores lifted high their swords, and the Retiarii their tridents and the chant was in perfect unison.

"We who are about to die . . ."

The Master of the Games gestured with a modishly limp hand, knowing his voice would never penetrate above the yelling, screaming fans in the seats behind, above and to each side of his presiding box. A trumpet sounded, and both band and crowd fell suddenly hush.

A Retiarius Denny vaguely remembered seeing from time to time during the past week, said to him, "All right, friend, let's go. It's going to be a long, long time before that gong sounds and there's no use stalling."

Denny looked at him, "Nobody's stalling, fisherman. Let's see what you can do with that net."

All about them, netmen and Gauls—the popular idiom for Secutores—were squaring off. From the side of his eyes, Denny could already make out a hapless Secutor caught in the meshes of his opponent's net, struggling to extract himself before the other could dispatch him with his sharp three-pronged trident.

Denny shifted his shoulders within the breastplate and shoulder armor of his right arm, and took stronger hold of sword and shield. He sized up his own opponent. The man's name was Philip, something or other; or perhaps that was his last name. He'd won through to the last day of the games, which automatically rated him one of the most efficient fighters in the nation. But, for that matter, it came through to Denny now, with almost a feeling of surprise, so had he, and so, in turn he, too, was one of the most efficient killers in all the land.

Unfortunately, in the training he had taken in this particular form of combat, he'd been more inclined to practice as a Retiarius, with net and trident, rather than as the slower moving Secutor. It had been bad luck for him to have been selected to take this part. However, at least he knew all the tricks of the netman's trade and could watch out for them.

And now, Philip was slowly circling him, his net held

for the cast. It was of heavy mesh and fringed with small lead weights, so that when thrown it opened up and then settled quickly. It looked innocent enough, as weapons go—and wasn't. How well Denny knew it wasn't. The amateur spectator in the stands, although there were few of those in the amphitheater today, might think the highly armored sword-bearing Secutor was the more satisfactorily equipped of the two, but Denny knew, and so did Philip.

Philip made a tentative cast, but Denny took a quick step backward, catching the edge of the net on his shield and tossing it off. Had he had time, he would have taken a slash at it with his sword. Sometimes it was possible to cut up a Retiarius' net to the point that it became largely useless.

Philip growled, "Come on, fish. Let's get going. You heard what the man said, the crowd wants action."

Denny was too old a hand to exhaust himself chasing his lightly clad opponent. He grinned, shaking his head. "Come in and get me, fisherman. 'I'm . . .'"

The other, who seemingly was rearranging his net, suddenly cast it, underhand, and came dashing forward to take immediate advantage of Denny's predicament. The cast had been a perfect one, impossible to avoid.

Denny lashed out wildly with both shield and sword. The mesh was about him in a confusion that he knew from experience could take long desperate moments to get out of, and the Retiarius was coming in fast.

Denny cut wildly at the net, slashing it in several places, even as he tried to stumble backward. Seconds, were precious. If he could just . . .

The trident darted at him, struck his wrists sharply. In a quick agony of realization, Denny knew that he was lost. He'd dropped his sword. Even as he stumbled back, extricating himself from the net, Philip gave the weapon a kick which sent it spinning away.

And now the other came in for the finish, stalking the unarmed fighter. Philip's lips were pulled back over his teeth, in a killer's snarl, and he muttered, "All right, this is it, friend," as he began his lunge.

Denny stooped suddenly, took up a handful of sand and threw it even before straightening up. It hit the other's eyes, and Philip, not unaware of the desperate trick's usage, tried a quick sidestep, a double sidestep. But Denny was slogging through the sand toward him. Philip slipped, fell to one knee, shook his head, rubbed desperately with his left arm across his bleared eyes.

Denny was on him. He brought the shield down in a crushing rabbit punch across the other's neck.

Without bothering to check whether or not his opponent was dead, Denny, breathing deeply, made his way to where his sword had been kicked, and recovered it.

He took stock. Somewhere in the fight he'd taken two or three minor jabs from the trident. He couldn't remember when, now. In combat, you seldom feel the pain of a wound. The pain comes later—if you survive.

Of the twenty-four men who had marched into the

arena a few minutes before, some four or five had already been eliminated from the fray. Ring attendants were hauling two of them out of the Portal of Death.

The fighting had spread throughout the whole arena, most individual fights, although in one case two Secutores had combined forces and were fighting back to back against the two netmen who were tormenting them. Two or three fighters, like Denny himself, had dispatched their men, and were standing momentarily alone and uncommitted while recuperating. This wouldn't last long, Denny knew. In short order, the screaming mob in the stands would demand they face each other.

This was the last day of the national games. The final elimination day. This was the day during which the victors of the combats of the week fought it out for the final triumph. There was to be no hanging back, no giving of quarter, no pulling of punches.

As was to be expected, the greater number of those who had been eliminated already, were Secutores. The slower moving swordsmen were proving easy game for the Retiarii. And now, not far from where he had so shortly before terminated his own first fight, Denny caught sight of a fellow Secutor at bay and trying to fight off two netmen at once.

There was nothing against it in the rules. This was a fight of elimination. When, and if, the Retiarii eliminated all the Secutores they would then be obliged to fight it out among themselves, if the gong had failed to sound by that time. Meanwhile, though, so long as the more heavily equipped Secutores continued to survive at all, the Retiarii devoted their efforts to eliminating these easier opponents.

The single swordsman was in a hard way, trying to avoid two nets at once, and the two tridents continually jabbing at him. He had taken his stance fairly near the podium wall so that he could have at least his back secure, but it was a matter of only moments.

It was none of Denny's concern. It was each man for himself, and the sooner others were eliminated, the sooner the gong, the desperately longed for gong, would sound, ending this year's games.

But somehow he found himself plowing, as quickly as he could in his weight of armor, through the sands to the other's succor.

The netmen, intent on their prey and on the immediate brink of success, failed to see him coming up behind.

Their Secutor foe was thrashing wildly, entwined in not one but two nets. He cut desperately, hopelessly, before they could dispatch him with their needle-pointed tridents.

Denny yelled, "Hold on, man!" And was upon them from behind. This was no time for nicety. No time for challenges and gentlemanly fair play. If the two netmen eliminated the Secutor, they would surely turn on Denny in his turn, and he had no doubt about the results of that eventuality.

Both the Retiarii twirled in quick alarm, but Denny's sword leaped forward, in jab rather than slash, and the blade entered one of his foemen's belly, ramming upward. The netman crumbled to the sand, bleeding heavily.

His companion, wide-eyed now, and without his net, ran quickly backward, to reorganize.

The crowd screamed, and Denny looked up at them.

The fallen netman held his hand up in the sign for mercy. Denny knew that if it was awarded him, that the ring attendants could get the man safely to the arena clinic to staunch the flow of blood and save the other's life.

But this was the last day, and the bloodlust was upon them as never before. Was it because there would be no more slaughter the following day, that now they must quaff the cup of death to its dregs? Was it because for the full week this fallen fighter had survived, survived a hundred deaths, and had made it to the finals? Did they find intensity of pleasure in the fact that so near success, he had found defeat?

They screamed their bloodlust, their thumbs jabbing down, down, or some of them inward toward their own vitals, as though gesturing *here, here, give it to him here*.

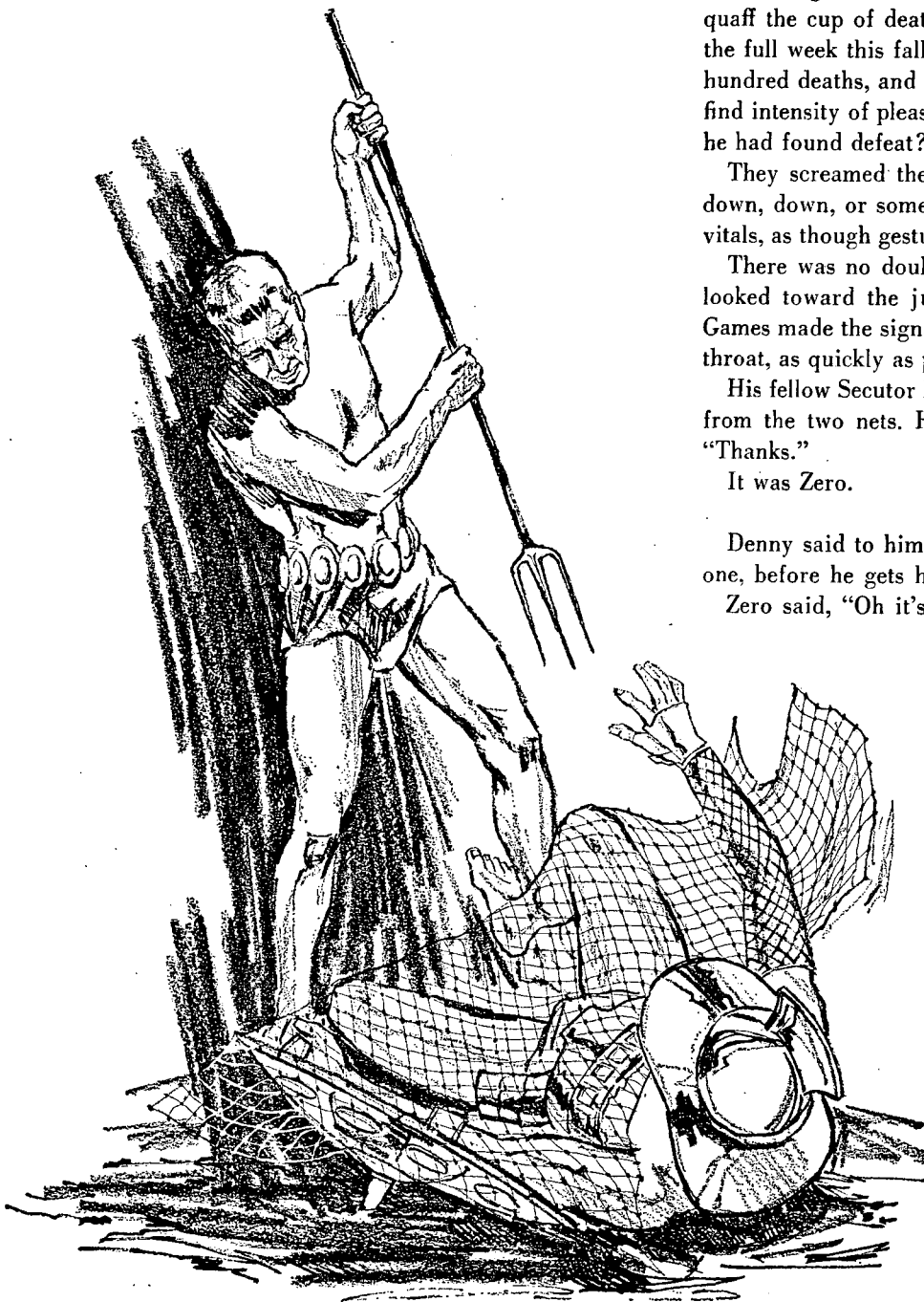
There was no doubt about the crowd's desire. Denny looked toward the judge's box, and the Master of the Games made the signal of death. Denny cut the netman's throat, as quickly as possible

His fellow Secutor had managed to disentangle himself from the two nets. He turned to Denny and chuckled, "Thanks."

It was Zero.

Denny said to him sourly. "Let's polish off this other one, before he gets himself another net."

Zero said, "Oh it's you, Denny. Well, thanks again."



Illustrated by Robert Swanson

They set upon the remaining Retiarii mercilessly. This was neither time nor place for mercy, nor for anything other than kill or be killed. This was the final day, and all bets were down.

He backed against the wall desperately. Equipped now with only the trident, he jabbed, and again and again. First toward one of them, then the other. Then desperately back again.

They came in from opposing sides, bent forward and a bit low, their shields outstretched to take his thrusts.

He was almost within range of their short swords, when he slipped and fell and the two co-operating swordsmen dashed in to eliminate him. But even as he went down, he thrust wildly and caught Denny in his unprotected right thigh.

Zero finished the netman off, and turned quickly to Denny. "How bad did he get you?"

"Pretty bad."

Zero's eyes darted quickly around the arena. There seemed to be more men on the sands than still standing. He grimaced. In the stands, the mob was already screaming frenzied instructions to them.

Denny had dropped to one knee when the trident had first ripped into him. Now he came to his feet again. This was the final day. The day of elimination. There was no wound sufficient to allow you to drop out of the fray. If you went down, the crowd was in no mood for mercy. He had seen the short shift they had given his fallen netman a few moments earlier. If he went down now, it would be the same for him. Thumbs down.

He muttered to Zero, "Well, no gong so far. Let's get over there and see if we can find somebody in worse shape than we are." He tried to grin. "I'm about at the stage where a sixty-year-old dwarf could take me with a slingshot."

Zero said, his voice low, "No. Listen, Denny. You've had it. You can hardly walk. Listen, that gong is about to go. Any minute now. You and I. We'll fight. Right here. We'll fake it until the gong sounds."

The crowd was screaming at them. Demanding they get into action. Demanding blood.

Only briefly, Denny wondered whether or not the other was setting him up for an easy victory. This was no place for gratitude, friendship, or even mercy. The final day of the national games. Dog eat dog. Each man for himself and the devil take the hindmost. He'd saved this Zero fellow from the two netmen, but they were bound by the rules of the arena to fight any comer, and if they failed to do so, the ring attendants themselves would finish them off. But possibly the other was right. Possibly enough of their fellows had been eliminated that the Master of the Games would signal the end. After all, the supposed ultimate purpose was to find the ten most competent combat men in the nation. The Master wouldn't allow it to continue until none survived at all.

"Let's go," Denny said. He shifted his shoulders again in the breastplate, grasped his sword, and advanced his

shield and armored left leg. And even as he took his fighting stance, he felt the blood flowing from his thigh, and weakness ebbing up through him.

That portion of the crowd nearest them was screaming hysterically. They had seen the one Secutor rescued from a seemingly impossible situation by the other. Had seen the two combine to eliminate both netmen. Now these two were at swords' points, fighting it out.

Zero, even as he came in, whispered harshly, "Make this look good as possible, Denny. Make it look good, or they'll see it. Then we're both sunk."

Denny swung at the other, even as he did so, realizing his weakness of arm. It was both the exhaustion of the fighting and the loss of blood. His sword clanged meaninglessly against Zero's shield, and the crowd shrilled its contempt.

Zero in turn whacked at him, and struck again. He came in closer, so that their movements would be the more difficult for observers to follow.

"Cover, confound it," he growled. "Cover yourself. I could've got past your guard that time."

The mob was howling for the kill now. It was obvious that Denny was faltering. They screamed for Zero to give him the death blow.

Denny muttered, weakly, "I . . . I'm blacking out . . . I . . ."

Zero cut at him twice more in a blur of motion, trying to make it look good, deliberately hitting him upon shield or breastplate. "Stall, Denny. Stall. That gong will go any minute now. Hang on."

His sight had gone hazy, and now he could no longer bear the weight of shield or sword. He could feel first his left leg crumble beneath him, and then he was on the sand.

For the moment, his sight cleared again. All was clear again. He stared up at Zero who was looking at him in an agony of despair.

The crowd was screaming again. Again? When had it ceased, even for a moment, since first they had entered the ring, so long, so long ago? So long minutes ago.

He made a supreme effort and held up his right hand in the plea for mercy.

But there was no mercy in them today. If there was ever mercy in them. A thousand thumbs were jabbing down, down, down. Ten thousand thumbs were jabbing down, down, down.

Zero shot his eyes to the judge's stand, his face working. And then resigned despair spread over it. He looked down at his fallen companion. "Sorry, Denny," he said. "I tried." The point of his sword descended.

From the side of his eyes, Denny could see an excited telly reporter on the podium, zeroing in on Denny's face, even as the moment of truth, the moment of death, was upon him. Zeroing in on his face with a zoom lens so that the tens of millions of viewers throughout the country, unlucky enough not to have been able to win tickets to

the final games, could watch his last split second of life, and how he faced black death.

It was then that the gong sounded.

Zero dropped his sword, swearing endlessly, tried to pick him up, and found insufficient strength in his own, combat wearied body. He glared up at the stands, where some of the fighting buffs were still screaming for the kill, either having not heard the gong which signified the ending of the games, or not being aware of the fact that the split timing of the situation had rescued the swordsman they had condemned to death. Zero snarled up at them, then yelled for the medics.

II

It wasn't as bad as all that. Denny had lost blood, but that was a simple matter. Only one of the wounds had been serious, and the arena clinic was more than ample to handle any wound known to the games.

When he came out of anesthetic, Zero was standing next to the bed, garbed now in every-day civilian wear. He grinned down at the other, then put a hand forth.

"The name is Jesus Gonzales," he said, pronouncing it *hey-zeus*, Spanish style. "Zero to you."

Denny shook. "Land," he said. "Dennis Land. Denny to you. And thanks."

Zero grunted self-deprecation. "No thanks called for. I was in the dill there, when you came galloping to the rescue." He pulled up a chair. "We're the only two *Secutores* who made it. And six *Retiarii*. I'd like to get my hands around the throat of that Master of the Games, the curd. Only eight of us allowed to come through. Eight! He could have made it twelve."

He looked at Denny. "You're not a pro, are you?"

"Me? Zen, no. And what's more, that's the last time I'll ever be in the arena, believe me."

Zero grunted. "You could make yourself a fistful of Variable common shares in exhibitions, you know."

Denny snorted contempt.

Zero looked at him oddly. "How'd you ever get sucked into the games, if you're that against them?"

"Sucked in, was the word. I'm a Etruscanologist, I guess you'd call it, and . . ."

"What in the name of Zen is a truscanologist?" Zero interrupted.

"An Etruscanologist. A historian, anthropologist, what not, specializing in Etruscans. At any rate, I've always been fascinated by the *ludi*, as the Romans called the original games. They got the idea from the Etruscans, you know, although their version was a much less rugged one. And ancient arms and their use, they've fascinated me, too. I've even written a book on the subject. Nobody bothered to read it, so far as I know. Now I'm working on another one."

"What's that got to do with you winding up in the national finals?"

Denny grimaced ruefully. "Like a cloddy, I used to

attend the local gladiatorial club school, to pick up material, since they use the identical weapons the Romans used to. I took the drill, worked out three or four times a week, with the club members. I even used to appear in the local meets. You know, where you have the electronic weapons and armor, and if you touch a man in a vital spot, a light goes on and he's eliminated."

"I know," Zero said.

"Well, at any rate, when it came time, this year, for our club to name half a dozen members for the first elimination meets, the stupid"—Denny shot a quick look at the other, before going on—"Upper who's the head of the club, nominated me. I tried to back out and nearly got myself demoted to Low-Lower, not to speak of having my appropriation killed."

"Appropriation?"

"As an Etruscanologist. It's nonproductive, so I have to get a special appropriation pushed through for my expenses. At any rate, my patriotism to the West-world, the Welfare State, was questioned. So I reversed my engines in short order."

"Why didn't you take a dive in one of the early eliminations? The crowds aren't tough in those local meets, especially when you've got a lot of friends and relatives up there in the stands. You can cop yourself a minor wound, then drop out."

Denny grunted. "It didn't work that way. Everything went wrong. Or, right, I guess you might say, since I survived. My opponents evidently had the same idea. At any rate, they were all falling down before me, before I could fall down in front of them."

Zero was laughing.

Denny said, "No joke. By the time I got around to a situation where I could have funk'd out, I probably would have got my throat slit, with the buffs giving me a thumbs down. I *had* to go on. How about you?"

Zero was evasive. "I guess I wanted the prestige," he chuckled. "It'll mean promotion for me. Maybe even get bounced a caste." His voice took on a slight tone of deference. "I'm only a Low-Middle. I suppose you're . . ."

Denny brushed it aside. "I'm only a Mid-Middle myself."

Zero said, "At that, we were probably the highest ranking combatants to make the finals. Once in a while, you'll get some dilettante Upper who'll participate, in the earlier eliminations, just for the glory of it . . ."

Denny snorted.

". . . But most of the cloddies out there are Lowers, and Low-Lowers at that. Making their fling for a bounce in caste and some extra common shares to make life a bit more bearable." The subject was getting a bit sticky for two persons who knew each other no better than they. Zero cleared his throat. "Well, at any rate, I suppose all of us can use the extra stock."

Denny shook his head. "Not for me, thanks. I'll donate my prize to whatever organization there might be that

works for incapacitated gladiatorial veterans, or their widows and children."

The other's eyebrows went up. He was a dark man. Mexican, Denny decided. Mexican, or possibly a Cuban. More Indian blood than Spanish, and stockier built than the average. Stockily built, but with the quick, lithe movements of the Latin. His face was inclined to be open, and in amusement transformed itself in such wise that no companion could but wish he smiled and laughed more often. Basically, Denny snap decided, a man of good will, and certainly the ideal lad to have next to you when whatever situation you were in had pickled and you were in the dill.

Denny said, feeling that he was striking a ridiculous pose before the other. "It smells too much of bloodmoney for my well being."

Gonzales considered him. "It's easier to have such compunctions, I imagine, when you have the unalienable basic stock issued to you that a Mid-Middle rates, than if you're a Low-Lower."

"I don't deny that," Denny said in self-deprecation. "Ideals come easier to those who can afford them. There is little ethic code on an empty stomach."

Zero laughed suddenly. "For a couple of lads who were wildly swinging ancient swords a few hours ago, we're waxing awfully philosophical. Look, the Category Medicine character outside said you needed rest. I'll take off. When'll I meet you again?"

Dennis Land hadn't been surprised that the other had dropped in to see him. After all, they owed their lives to each other. On the other hand, they undoubtedly had little in common, beyond their brief companionship in the arena. He wondered at the other's desire to continue their relationship. Or, perhaps it was just polite conversation. He said, "Oh, around. I do most of my work at the University."

Zero's eyes went up. "You're Category Education?"

"That's right. Category Education, Sub-division History, Branch Research, Rank Professor."

"Rank Professor!" Zero blurted. He laughed suddenly. "And a finalist in the national games! Zen! The first time in history." He had come to his feet, but was still chuckling.

Denny didn't think it was that funny. The whole thing hadn't been funny. Unless your humor ran to the sick and you found laughable the comedy of errors that had taken a student of ancient weapons, ancient customs, from the security of his ivory tower of research into the blood, gore, terror and desperation of the modern gladiatorial games.

Still chortling amusement, Zero moved toward the door. "I'll be seeing you when you get out of that bed, Prof."

Dennis Land looked after him, even when the door had closed. There was something about the dark complected man that didn't quite come through. On the face

of it, they were indebted to each other, comrades in arms, so to speak, by right of blood shed in defense of each other's very lives. But while he, Denny, had revealed his position in life, the nature of his work, his address, and even his views on various subjects, Zero had said remarkably little about himself. He hadn't even mentioned his category. Perhaps it was Military, since he had hinted that he might achieve a bounce in caste as a result of being a finalist in the national games. But he didn't quite seem the soldier. He didn't have the soldier's stance. Besides, Denny knew enough about the Category Military to know that an old pro wasn't foolish enough to participate in the national games. The percentages were too bad, and an old pro doesn't become an old pro, in the Category Military, by failing to consider the percentages.

Dennis Land shrugged. He wasn't really interested in the mystery of Jesus Gonzales. What he was interested in was getting out of this bed and back to his work. He suspected that his victory in the games was going to cut very little ice at the University. In fact, old man Updike, the Academician heading the department of history, would undoubtedly take a dim view of one of his research men becoming involved in anything quite so crude. As an Upper born, Ronald Updike had little patience with his caste and rank inferiors who, in whatever manner so distinguished themselves that his own prestige, his place in the sun, was threatened. Long since, such as Professor Dennis Land had learned the art of the yes-man; had learned to bestow on Academician Updike the greater credit for anything discovered or otherwise accomplished while working in that worthy's department. Dennis wasn't overly bitter about this aspect of life. He was used to it. He had been born into a stratified, *status quo* society and accepted it, adapting as best he could, as did everyone else.

There was one thing he was sure of. Dennis Land was not going to jump a caste as a result of his foray into the gladiatorial meets. Not in Category Education, which was as frozen a field as could be found in the West-world. He had been born a Mid-Middle, in the Category Education, and he had no doubt but that he would die a Mid-Middle. Theoretically, he could cross categories into one of the fields in which taking a bounce in caste was possible, such as Military or Religion, but he had been raised in the atmosphere of the University, his father, grandfather and great-grandfather all having been teachers before him. His abilities had been such that he had reached the rank of full professor before any of his forebears, it was true, but his chances of bouncing his caste to High-Middle, were remote indeed. As they taught the Lowers, in slogan, *what was good enough for Daddy, is good enough for me*.

He wondered, as he sat there, whether his refusal of the prizes due him as a surviving participant in the national games made sense. Dennis Land was not a pacifist, certainly not in the usual sense of the word. If the cause was strong enough, he believed in fighting for it, to

the death, if necessary. However, he was certainly no fracas buff, a fan of the fights covered so well on telly and in which hundreds and even thousands of mercenaries were killed in the small-scale wars between corporations, between union and corporations, or between two rival unions fighting a jurisdictional fracas. He found no pleasure in either dealing or witnessing death, and was considered somewhat of a fuddy-duddy even by university colleagues, as a result.

No, he wanted no profit from the blood he had spilt in the arena. He had rationalized his appearing in the games at all. As he had told Zero Gonzales, he had been unable to avoid the situation. Hardly before he could realize what was happening to him, he had been pushed into a spot where it was either kill or be killed. And Dennis Land was a high survival type. He had not created the institution of the national games, and it was beyond him to end it. When the institution struck him, personally, he survived as best he could.

But, no, he couldn't take the stock shares he had won as a result of the deaths of so many. He would donate them to whatever suitable agency he could find. Actually, he had little need for extra income. Besides his University pay, as a Mid-Middle, he had been issued his basic Inalienable common stock shares upon birth. The income from these was sufficient to allow him to live in modest comfort, even modest luxury compared to the lot of, say, a High or Mid-Lower, not to speak of the squalor of a Low-Lower.

It was the Welfare State, People's Capitalism, so-called, and there was security for all from the cradle to the grave. The most improvident fool had no manner in which to squander the Inalienable basic common stock shares which were issued him, according to the caste into which he was born. Each month, his dividends were deposited to his credit account, nor was there any way to steal his Inalienable stock, nor to gamble or con it away from him. Each citizen of the West World was secure if he wished to be or not. Medical care, education, even entertainment, was free. Entertainment above all, and the overwhelming majority spent the greater part of their lives before their telly sets, sucking on their trunk pills for happiness, watching the screen for the excitement of the ultimate entertainment—violent death, as to be witnessed in the fracas and the gladiatorial games.

Of course, given ambition, and given the good fortune to be born into a category which still offered chances at employment, having not been completely automated out of existence, it was possible to acquire additional shares of common stock. Such shares could be bought and sold, and, even in the face of all but confiscatory taxes, an ambitious man could place himself in position to increase his basic income considerably—given a chance to work. However, it could prove difficult for one who was born, say, in Category Food Preparation, Sub-division Cooking, Rank Chef, since cooking was no longer done by individuals. Automation had taken over with a vengeance

in this field, and such recipes as were newly developed were done in huge research laboratories and by competent technicians who had studied food for the better part of their lives, before even being allowed to innovate.

Dennis Land stirred in his bed. He wondered why all this was coming back to him. He had accepted it throughout his life. Was it, perhaps, that the past couple of months, when he had been face to face with death almost daily, had brought him to the point of questioning some of the aspects of his existence, which he had never thought to question before?

It was considerably worse than he had expected; his interview with Academician Ronald Updike upon his return to the University. Actually, Dennis Land's position as a professor doing historical research was one that he valued considerably, and one which he had no wish to jeopardize. Teaching *per se*, had little charm for him. It was seldom, these days, that one found a student in a class who was truly scholar material.

Perhaps that was the fault of society, rather than of the individual student, although to have voiced such controversial opinion would not have been wise, even among his colleagues. One simply didn't criticize the government, nor the institutions of the West-world. But what was the incentive for a student to buckle down to his studies when no matter how successful, it was unlikely that such study would improve his lot either financially, or in his place in society? You were *born* secure, and you were born into the social niche into which you fitted for all your days. What need was there for study?

Of course, there was always the exception, like Dennis Land himself, who studied for the pure pleasure in seeking knowledge. He sometimes wondered why there were so few who were similar. Many of his fellow instructors, he knew, actually resented having been chosen, by the computers, to fulfill the task for which they had been trained. Education was one of the few fields that still stubbornly refused to yield completely to automation, though certainly there was plenty of it in the form of telly lectures, and such. As a result, while a citizen born into Category Mining had less than one chance out of a thousand of ever being called up to perform his function, a person born into Category Education, had at least one chance in four. And yes, Dennis admitted, many of them resented the few years they must devote to the Welfare State. Most would have preferred to take their positions, along with the Lowers, seated before their telly sets, sucking their trunk pills, and living their lives away in a haze of happy satisfaction, untouched by reality.

Yes, his interview with Ronald Updike, hereditary aristocrat, Upper by birth, and one of the few Academicians the University could boast, was far more satisfactory.

Upon his convalescence, Professor Dennis Land had appeared for interview, following his protracted leave of absence to participate in the games. He had stood, much

like a recalcitrant grade schoolboy on the carpet for too free use of his peashooter. His superior glared at him, his head high, his nostrils all but flaring. Academician Updike had fully learned that aspect of the aristocrat, down through the ages, in which an inferior could be eyed in a certain puzzled manner as though wondering what made the fellow tick.

He said finally, "I suppose, *Professor Land*, that you are unaware of the fact that during the past two weeks the campus had been literally flooded with gaping, gawking, drooling idiots."

Dennis Land didn't get it.

"Fracas buffs!" his superior snapped. "Gladiator fans, seeking the merest glimpse of one of their latest heroes."

Oh, oh. Denny might have foreseen that aspect.

"Nor is that all! Telly reporters. Fracas buff magazine columnists. Tri-Di movie scouts. Even some moronic publicity men from some munitions corporation or other, seeking endorsement!"

Denny gestured with his hands in an attempt at placation. "Sir, this isn't of my doing. I had . . ."

"Not of your doing, you blithering cloddy! Do you think these cretins would be overrunning the entire school, not to speak of just our department, hadn't it been for your confounded stupidity in participating like a drivel-happy Lower, in those idiotic . . ." The Upper caught himself in mid-sentence. Even one in his position didn't openly challenge an institution as firmly entrenched as the games. He switched subjects, rapped his desk sharply with his knuckles. "I assume you have some sort of excuse, for turning yourself into a public entertainer and deserting your duties as a research historian, *Professor Land*."

Dennis Land tried to get a word in. "Sir, it all began with that project I told you about some time ago. The book on ancient arms and their usage, which was to be published under both our by-lines."

"Are you attempting to lay this at my feet, *Professor Land*!"

"Sir, all I was saying was that the study would have been quite a unique one, and probably widely commented upon. For instance, the long debated length of the pike used by Philip's Macedonians in the phalanx. For years, popular belief among historians was that the rear phalanxmen wielded an eighteen-foot pike. But my research, on the spot, actually drilling with ancient weapons, learning their usage, proved to me that the tradition is ridiculous. Such a spear would be absolutely unwieldy, and certainly would have caused more difficulty in the ranks than harm to the enemy. You could hardly carry one, not to speak of running with it, in charge."

"What in the name of Zen, has this got to do with your antics as an actual gladiator?" Updike bit out.

"It was this very research that caught me up in a position where I couldn't refuse to participate. I had joined one of the more prominent clubs, a gladiator

club, in which the membership, as amateurs, gather to fence, to practice archery, to amuse themselves in learning to throw javelins. By the way, sir, I also discovered that the alleged accuracy of the Roman and Etruscan spear-thrower must have been greatly exaggerated."

"Land! You're a featherbrain. A featherbrain, understand? You keep drifting away from the subject. The fact is, that you have made this university notorious. A professor of history, winning in the national games. What sort of scholastic reputation does this add up to?"

It came to Denny, suddenly, that the other was on mescaltranc. His eyes had that dull gleam, if that description makes sense. Mescaltranc, reserved for the usage of Uppers, the supply being such that less exalted castes were forbidden its pleasures. And he suddenly understood, too, the man's real motivation.

It was simply impossible for Ronald Updike, Lower Upper in Caste, Category Education, Sub-division History, Rank Academician to see another, Dennis Land in this case, the center of the stage. Denny had no doubt that substantially the other's complaint was correct. Denny was a celebrity such as this school had never before produced. For the balance of this year, at least, he would be the focal point of scores, if not hundreds, of telly reporters and other news and magazine men, seeking stories. He would be the focal point of countless fans, seeking autographs, seeking souvenirs, and, amongst the women fans, seeking to date him.

No, it was beyond Updike to bear seeing another subjected to this adulation—no matter that Denny wanted it not. He wondered now what the other was going to do about it. But that wasn't long in coming.

Updike snapped, "I've discussed this with my colleagues, *Professor Land*, and it has been decided that the situation is intolerable. We have decided it best that you take an indefinite leave of absence from the University."

"Indefinite?"

"At least a year, professor. Possibly, just possibly, by the end of that time, we shall see fit to consider your return."

Dennis Land said hurriedly, "But, sir, wouldn't it be possible simply for me to go abroad? To do some field research in central Italy? My appropriation for Etruscan research is such that I could easily spend a full year . . ."

"*Professor Land*, I am afraid that the staff has seen fit to reverse your appropriation. Frankly, I was never particularly impressed by the value of the subject you chose to pursue, that is, the effect of the Etruscan civilization on early Rome. No. No, I am afraid professor, that the funds involved have already been diverted to other, and more practical work. Now, as you know, I am more than busy. More than busy."

Busy sitting here over-tranking yourself, Dennis Land thought bitterly, resignedly. There wasn't a chance. Never a chance. He knew his department superior despised him, and always had. The man had no intellectual curiosity himself, but bore his position simply for the

prestige that redounded upon him. The man was a cloddy. Academician, he might be, but Denny wondered bitterly who had done the actual work that resulted in that highest of university degrees. Well, what difference did it make? Ronald Updike was an Upper born, a gold spoon tucked carefully into the side of his mouth, at birth.

Denny turned and left, without further words. What use were further words?

The only thing in the world he really wanted to do. The only thing he really cared about, was barred to him. He had no illusions. Without the university's facilities, he was in no position to continue his work. In fact, he doubted if the authorities wanted him in the vicinity of the campus at all, and the university was the only place this side of Rome where the raw materials of his study were available.

A year! Ha. Updike's real meaning was clearly understood. Dennis Land would never return to the university. After a year, or after ten. He was *persona non grata* in the field to which he had devoted his life.

III

Yuri Malyshev had flown in late the day before, on the rocketplane from Alma-Ata. He could have reported to Chrezvychainaya Komissiya headquarters at that time, or any other time, for that matter; the ministry originally founded to combat counter-revolution and which had now spread to deal with espionage and counterespionage as well, never slept. Obviously, could never sleep. However, Yuri Malyshev was on the piqued side. In a world where few devoted more than ten hours a week to their livelihood, he, Colonel Yuri Malyshev, hadn't had a vacation in nearly a year.

So instead, he checked in at the Hotel Gellért, there on Gellért Ter at the foot of the Buda hills and the edge of the Danube. The Gellért was one of the older hosteleries of the capital of the Soviet Complex, but the colonel consistently used it. A former spa, it had an air of the less gaudy, less shiny, less raucous Budapest of long years gone by. Besides that, the well-situated terrace restaurant provided what in Yuri Malyshev's belief was the best *halászlé* fish soup, and *rostélyos*, potted round steak in paprika sauce, in town, and Yuri considered himself a gourmet. For the food, the Tokay Aszu wine, and, of course, for the music, he could bear Budapest; for the rest he hated the bureaucratic capital city.

Following dinner, he strode across the Szabadság-híd bridge, and then along the Corso where the night spots clustered. He had to admit, despite his scorn of Budapest, that it offered considerably more in the way of nightlife than did say, Moscow or Peking which were inclined to be on the stolid side. Yuri Malyshev was seeking music, gypsy music, and he found it in the terrace club of the Duna hotel. Over a chilled bottle of reisling, he sat and listened.

Of Cossack blood, the colonel was in his early thirties,

was tall for a Russian, and classically handsome. Though he was in mufti, his bearing was such that any observant person would have fingered him immediately for a soldier, a soldier who had known combat. Even hadn't it been for the faint scar running from temple to chin point, an observant one would have felt the colonel had known combat, and many times. He had no doubt that he could easily have found feminine companionship, here at the Duna tonight, but there was a lassitude on Yuri Malyshev. Confound it, he had a vacation coming to him, and here they'd put through a hurry call to report to the highest offices of the ministry. That meant, if he knew the Chrezvychainaya Komissiya, and he did, an assignment of considerable import . . . and danger. Yuri grunted. He would have found less danger in life had he remained in the Pink Army, rather going into counterespionage.

He dropped the line of thought, poured himself more of the slightly greenish, slightly effervescent wine, and forced his attention to the violins.

In the morning, he had the hotel assign a hovercar to him—his priority being high enough to drive in the city—and drove leisurely over to the Pest side of the capital. He paralleled the river until he reached Margitsziget Island, then turned right on Szt. Istvankorut to Marx Square, which he crossed to emerge on Lenin. Even at this time of the morning, he noted, the traffic was brutal.

He turned left off Lenin and onto the less busy Rudas László Utca, with its foreign embassies and governmental buildings. That housing the offices of the Chrezvychainaya Komissiya was on the far end of the street, facing on the park, and from the entry one could see the national museum and the colossal bronze of the Magyar warriors of antiquity.

Colonel Yuri Malyshev recently had been working out of the ministry's offices in Alma-Ata, Lhasa or Peking, and occasionally Moscow, not here in Budapest. There had been various changes in top personnel since he'd been in Budapest. However, he was known well enough that the two sentries came to the salute upon his approach, in spite of the fact he was in mufti. Nor did the preliminary receptionist in the main foyer ask for his credentials. The colonel marched through and to the corridor beyond, marble floored and with long rows of classical statutory, and Hapsburg period tapestry. It came to Yuri Malyshev, all over again, that the offices of the Komissiya had many aspects of a museum.

Before the offices which were his destination, he stopped at the door and snapped to the plainclothesman stationed there, "Colonel Yuri Malyshev. On appointment."

"Yes, colonel." The other opened the door for him, closed it behind.

It was a reception room, bare of other than two or three chairs, and a desk behind which sat a male receptionist in the uniform of the MVD.

He outranked the other, but in these highest of echelons, rank sometimes meant less than elsewhere. Very possibly this captain was in position, given reason, to pull the rug out from under such field men as Yuri Malyshev. As a consequence, the colonel made no effort to pull rank. He said, evenly, "Colonel Malyshev. My orders were to report immediately to Comrade Kodály."

The captain said, "Very well, Comrade Colonel. If you'll just wait for a moment." He gestured at the chairs.

Yuri sat down and crossed his legs. He wondered vaguely what it was this time. Actually, the nature of the ministry for which he worked had changed considerably in the long decades since the original revolution. He wondered whether Felix Dzerzhinsky the Pole who had originated the Cheka, back in Lenin's day, would recognize the organization it had become. The full title then had been, Extraordinary Commission for Combating Counter-Revolution, Sabotage and Speculation, a mouthful even for the Russia of 1917. And the others who had followed in those years of torture, execution, sadism and fanaticism. Menzhinsky, who at least was probably sane; Yagoda who lasted for two years of sadistic power; Yezhov who supervised the great purges, and wound up himself purged; Beria, the last of Stalin's butchers, liquidated in his turn when he attempted to step into his late master's shoes. Ai! the list was a long one.

The name had changed from time to time, down through the years. Cheka, GPU, OGPU, NKVD, MVD, and this department and that department within the Komissiya, the MGB the KGB. And, for that matter, the ministry's tasks had changed. The peasants, who had once been purged in the millions, were now tranquil—if, indeed, one could call them peasants any longer.

The colonel recrossed his legs. This was the way of bureaucracy. They hurried him all the way from Siberia as though the whole Sov-world was afire. Then he sat in an outer office, cooling his heels.

He cooled them for another full hour, and began to wonder about his lunch. The captain at the desk ignored him, going about his business.

At long last, the door to the inner sanctum opened and . . .

. . . A giggling young comrade in the uniform of a sergeant of police, emerged. The uniform was not quite straight; nor was her lipstick. What remained of it.

She looked at the captain at the desk, giggled again, straightened her skirt, shot Yuri Malyshev, a brazen, rather than defiant, glance, then took her leave.

The captain said, without inflexion, "You may enter now, Comrade Colonel."

Yuri had winced at the girl's first appearance. Now he came to his feet and his face fell into the same expressionlessness as that borne by the captain. He marched to the door leading to the office beyond, squared shoulders, took the knob in hand and entered. It was the first time he had actually met his ultimate chief, Ferencz Kodály, who had recently been given this post.

His ultimate chief, who was said to be Number One's closest companion, sat behind his desk upon which sat a bottle of barack at least two thirds empty. To his right was a serving cart covered with Hungarian *hors d'oeuvres*. It had been well but messily sampled. There was a couch on one side of the room and the colonel's eyes avoided it, though when he had first entered he had noted its messed condition.

Although in mufti, he came to attention before the desk. "Colonel Malyshev, sir."

The other started at him, blearily. "Oh. Malyshev, eh? Heard a great deal about you, Comrade. Great deal. Have a drink."

One didn't refuse to have a drink with Ferencz Kodály. Besides that, Yuri Malyshev felt he could use a drink.

"With your permission, Comrade Commissar." He stepped forward to the open office bar which sat to one side, took up a three-ounce glass and turned back to his superior. "For you, Comrade Commissar?"

The other mumbled something that ended in barack, which Yuri took for assent. He poured a stiff jolt of the apricot brandy, distilled down to the point where the taste of the fruit was gone and the liqueur as dry as vodka, placed it before his chief, then poured another for himself.

He held it up in toast. "The final goal, Comrade."

"Worl' revolution," the other slurred, in the formula reply. Kodály knocked the drink back over his tonsils, in practiced stiff-wristed style. Before putting the glass down, he filled it again from the bottle before him.

"Now then, eh, Colonel . . ."

"Malyshev. Yuri Malyshev," the colonel said. He tried to keep from staring at the other.

"Eh. Of course. Well, what could I . . . I do for you? Very busy, actually. Always busy."

The man was drunk. There was no doubt of that. Yuri's eyes went to the window, as though to check. It could be no later than eleven o'clock. At this time yesterday, he had been in Kazakhstan, in Alma-Ata, its capital. The orders he had received had been most definite. To repair to Budapest, highest priority, and report for an immediate assignment. He had thought he was being bold to the point of almost insubordination in not turning up at headquarters the evening before. But now . . .

He cleared his throat and said, "Colonel Yuri Malyshev, Comrade Commissar. Field agent, recently working out of Lhasa or Peking. My orders were to drop everything and report immediately to your offices."

His ultimate commander stared at him.

Finally he said, "Well, don't just stand there. Have another drink. Heard a great deal about your efforts. Imperialist spies, down in . . . Hanoi . . . wherever. Good job, Colonel Malyshev."

Yuri Malyshev had never been to Hanoi. He'd never even been to Indochina. He had a feeling of desperation beginning to manifest itself. He covered by pouring the



second drink his superior had offered him, although he hadn't quite finished the first. Yuri Malyshev prided himself on being a disciplined drinker. He seldom took alcohol before afternoon, and usually not until nightfall.

The tiny TV screen on the desk's inter-office communicator lit up and Ferencz-Kodály stared glassily at it. He muttered something, then clicked it off with a curt gesture.

He looked up at Yuri Malyshev. "Assignment, eh? Course. Course. Very important project. Important. Details given to you by assistant. My assistant. Like another drink?" He half closed one eye, as though offering an indiscretion. "One for the road, as the British say, one for the road, eh?"

Yuri came to attention again. "Thank you, Comrade

Commissar, but if my wits are to remain sharp, I should avoid it."

The other grunted at him, and eyed the brandy bottle again, the loose mouth working.

Yuri stood there, not knowing whether or not he was meant to leave. Finally, when the other said nothing, he said, "With the Comrade Commissar's permission," and turned and left the room.

The captain's face was as expressionless as it had been when the girl sergeant had left earlier. He said, flatly, "There was evidently a slight mistake in your appointment, Comrade Colonel. You were to see Comrade Korda rather than the Commissar. He has been trying to locate you."

"All right," Yuri said, keeping testiness carefully from his tone. "Where do I find Comrade . . ."

"Korda," the captain said. "Zoltan Korda. One of the men in the corridor will take you to his office."

The office of Zoltan Korda contained neither bar, serving cart of dainties, nor couch. It contained very little besides Zoltan Korda, his desk, two chairs for visitors and several filing cabinets. However, the outer office was packed jammed with desks, clerks, communication equipment and other office paraphernalia.

Yuri was hurried on through, without pause or wait, and when the door of the smaller inner office was closed, the noises of the commotion without were cut sharply off.

Zoltan Korda eyed him, up and down. The other was a smallish, nervous man, inclined to bore his eyes into yours. His suit looked as though it had been slept in, and he was a chain smoker, lighting one off the other, seldom waiting long enough between cigarettes to need a match.

Korda said, "Nikita! Colonel, where have you been?"

Yuri Malyshev had heard of the other, vaguely. Kodály had brought him along with him when assigned to this post. An office drudge to whom the Commissar handed over routine. Evidently efficient enough, but just one more bureaucrat in a world of bureaucrats.

He said wearily, "My orders were to report to the offices of Commissar Kodály immediately, for an important new assignment. I did."

"To the *offices* of the Commissar—not to the Commissar, himself. You should have . . . Well, never mind. Sit, down. I have just been reading your dossier. It is an impressive one."

"Thank you, Comrade."

The other suddenly peered at him, questioningly. "You've been drinking. At this hour of the morning?"

Yuri cleared his throat, and ran a finger down along his facial scar. He said, ruefully, "The Commissar . . ."

"I see. Well, have you ever been to the West?"

There was a stir of excitement within him. "To America?"

"Possibly, eventually, but actually no further than Common Europe, to begin with."

"On various assignments, Comrade. And on various

occasions on vacation. To Paris, Rome, once to Nice."

"This time you're on assignment, Colonel Malyshev. Probably the most important of your career. Colonel, I'm going to refresh you with some background material most of which you undoubtedly already know. However, in the way of preliminary, what does the term *frigid fracas* mean to you?"

"Frigid fracas? Why it's West-world idiom. In the early days following the Hitler war they called the relationship between the Soviet Complex and the Imperialist nations a Cold War. As their slang, they call it, shifted, the terms fracas became popular, and cold war evolved to frigid fracas."

"Quite correct. Now, what point would you say the frigid fracas remains at currently?"

Yuri Malyshev shifted in his chair, not having the vaguest idea what the other was leading to. "I'd say, it's truly frozen now. With the Universal Disarmament Pact, and complete inspection, the earlier dangers have been eliminated, Comrade."

The other nodded, lit a new cigarette from the old. "By the way, are you a Party member? Your dossier doesn't tell me so."

Yuri shook his head. "I didn't have the fortune to be born into the Party."

"Neither am I. Do you know the derivation of the salutation 'Comrade'?"

Yuri shook his head again. Zoltan Korda, he found, was a confusing man. But then, Yuri Malyshev had usually found the spicy Hungarians confusing people.

"In the early days, the very early days of such pioneer socialists as Marx; in Germany, Engels; in England, DeLeon; in America, the term was used to designate fellow fighters for the cause. Whether or not the goals for which they aimed have ever been achieved, and that is debatable, the fight is no longer being fought. I find the term somewhat ridiculous, particularly when not being used by Party members . . . who still hang onto it."

Yuri Malyshev was inwardly surprised. This was not the way one talked in the Sov-world. At least not in the echelons with which he was familiar. He said, blankly, "Yes, Com . . . that is, sir."

Korda tapped the dossier, open on the desk before him. "I am somewhat surprised you are not a Party member. I note that your illustrious grandfather, Vladimir Malyshev, was one of the earliest companions of Lenin, and a founder of the Bolsheviks."

Yuri said without inflexion. "He was executed in 1938 as a Bukharinist Rightist Deviationist."

The bureaucrat shot another glance at the papers before him. "Whatever that means," he said wryly. "But he was rehabilitated more than a decade ago, his body exhumed and reburied in the Kremlin wall, beside those of his old comrades."

"However," Yuri Malyshev said, his voice still even, "my father was not a Party member, and, as a result . . ."

"Yes. Of course. By the way, what does the term, *Trotsky lives*, mean to you?"

Yuri looked at him and finally shook his head. "Why nothing."

"Well," Korda said dryly, "if you ever hear it, make note of the speaker and report him to this office."

Korda returned to the subject, after inhaling deeply and expelling clouds of heavy smoke through his nostrils. He was probably smoking the dark Bulgarian tobacco, Yuri decided, wondering how the smaller man's lungs could take the punishment awarded them.

"In the early days of the, ah, frigid fracas, the situation was a fairly uncomplex one. We had our two great powers, the West, which consisted of the United States and her satellites, and Russia and hers. There was also a sizable number of neutrals, which were at that time poorly organized and carried little weight in world controversy."

Thus far he had said nothing unknown to the most dullard schoolboy. Yuri held his peace.

Ash dropped unheeded to the other's suit. "But times have changed. While the Soviet Complex, has, after various difficulties, amalgamated into one cohesive whole, most of the satellites of the United States, grown strong through the very support the Americans gave them, finally broke away and joined into what we now know as Common Europe, complete with some satellites of their own, largely in Africa. And the Americas, of course, slowly amalgamated too, so that now it is a United States of the Americas which we confront. In short, the West-world."

Yuri was nodding. There was still nothing new.

"And, of course, the neutrals, forced by necessity, if their voice was to be heard at all, strengthened their ties considerable and now operate as a strong block. Colonel Malyshev, instead of the two great powers confronting each other, as in the early days of the Cold War, we now have what amounts to four. The world is currently divided in four."

Yuri Malyshev said, "The Neut-world hardly counts. They never developed nuclear arms, nor rocket missiles. Of course, since the Universal Disarmament Pact we don't have them either, nor does Common Europe nor the West-world. However, as everyone is aware, we have the know-how to build them, and quickly."

It was his superior's turn to nod. "Yes. And who is so foolish to doubt that if war broke out between any, or all, of the great powers, that the race would be on to get into production. A-Bombs, H-Bombs, missiles to carry them, anti-missiles to intercept them. None exist. Though all exist in blueprint."

Yuri Malyshev shifted again. This was still all very elementary. Did the other think him uninformed?

The Hungarian ground out his cigarette, and his eyes bore into those of his subordinate. "Colonel, what would you say if I told you there is a present danger that the frigid fracas, the cold war, will warm up?"

Malyshev stared at him.

"No. No, sir," he said finally. "We've reached a static *status quo*. The Soviet Complex is self-sufficient, and we are only now so conquering our problems that the goals we set so long ago are being met. We were handicapped, compared to the West-world, by starting so far behind, and by having such masses of population on our hands, particularly in China. But we're self-sufficient, and neither want nor need war. And the West-world?" He shook his head again. "They have their Welfare State, their People's Capitalism, as they call it. They've solidified into a stratified society that wants no change, brooks no change. They, too, are self-sufficient. And their government has become so Xenophobia minded that it discourages practically all communication, not only with us, but with Common Europe and even the Neut-world. What reason would they have for allowing their own position to be threatened — by taking the chance of precipitating war?"

Zoltan Korda nervously lit another cigarette. "You haven't mentioned Common Europe."

Yuri looked at him. They had obviously come to the point.

Korda pointed the cigarette. "It is quite true that both the Sov-world and the West-world are self-sufficient. Neither needs either raw materials from abroad, nor markets to sell surplus production. We can both go-it-alone as the expression has it. But Common Europe, is another matter. As you'll remember, following the Hitler war this comparatively small area of the world's surface debouched into the second industrial revolution with an élan far and beyond anything seen through the rest of the capitalistic world. With their industries largely demolished by the bombing, they could only build anew, and, obviously, built the most ultra-modern, automated plants that their scientists and engineers could design. As first the Common Market, and later Common Europe, evolved their production passed even that of America."

He seemed to switch subjects. "Colonel, why did the United States and Japan fight during World War Two?"

Yuri scowled at him. "Why . . . why the Japanese navy attacked their naval base at Pearl Harbor . . ."

His superior was shaking a hand negatively. "No. That was the immediate spark which set the war off. Perhaps I should have said, why did the Japs attack Pearl Harbor? Pearl Harbor was no more the reason the war started than the kidnaping of Helen precipitated the Trojan war."

Yuri Malyshev was based firmly enough in the Materialist Conception of History to know what the other was driving at. "You mean there were basic economic reasons behind the conflict."

"Of course, and, actually, fairly similar ones to those that brought on the conflict between the Hellenes and the Trojans. The Trojans, as you'll possibly recall, dominated the Hellespont, the straits through which the Greek merchants' ships must pass to get to the Black Sea and the

profitable trade there. It was intolerable to the Greek economy that they be forbidden this passage, or overly taxed for it. In our modern times, the Japanese were attempting to so unite all the Far East that they could stake it out as their own private domain, milking mainland China, Indonesia, and all the rest of their raw materials and utilizing them for dumping ground for Japanese manufacturers. The United States had no intention of allowing the Japs to so dominate such a large and profitable area of the world. Fabulous quantities of military equipment were sent to China to help in its fight against the Japanese invasion, and finally such volunteers as the Flying Tigers, who, of course, were pilots trained in American government flying schools, and flew the latest of U. S. Military aircraft. Toward the end, it is recorded that the American government could hardly wait for the Japanese to perform some overt act which would allow full hostilities to begin."

Malyshev said slowly, "Sir, what has this to do with the current situation?"

Korda twisted his mouth. "You find me long-winded perhaps. Believe me, the matter is most pressing. The thing is that neither the West-world, nor the Soviet Complex, with our present socio-economic systems, are pressed for either sources of raw materials nor markets for manufactured surpluses. But that does not apply to Common Europe. For some years now, their long-term boom has been slackening. That area once known as Germany currently can produce as many hovercars and trucks among other examples as could be utilized by all Common Europe. So does the area once known as Italy, and that once known as France. They've gone into what economists once called a depression." The bureaucrat snorted. "Rather, going further back still, a business panic. They *must* have more outlets, more sources of raw materials. The Gaulle knows it very well, and would seem to be making plans."

Yuri said slowly, "Obviously The Gaulle is not so mad to contemplate attacking either the Soviet Complex or the West-world."

"Dictators, whether or not they are considered benevolent dictators, are unpredictable," his superior murmured. "However, I am inclined to agree with you. No, there is just one source of outlet for him and his Common Europe. The Neut-world, with its teeming populations, and its underdevelopment."

Yuri was shaking his head, even as he ran a finger down the line of his scar, in thought. "There is just one difficulty. Neither the Soviet Complex, the West-world, nor the World Court would permit such a descent of The Gaulle and his armies on the largely defenseless Neut-world countries."

His superior had let his cigarette go out, now he lit another, nervously. "We get to the point, and the reason for your being here. Earlier we mentioned the fact that although neither West-world, Common Europe, nor the Soviet Complex actually possessed nuclear weapons,

missiles, nor anti-missiles, we had them in blueprint and could hasten into production given a breakdown of the World Court and the Universal Disarmament Pact. As it is, we are balanced, all in the same position, and hence safe. However, suppose that any one of the three should come up with an anti-anti-missile missile?"

Yuri Malyshev's face was blank.

Zoltan Korda leaned forward. "The theory in nuclear, missile warfare is that the attacker fires his nuclear warhead rocket at his foe. The foe protects himself by attempting to intercept it with an anti-missile rocket interceptor. But what if the attacker has sent on ahead, anti-anti-missiles to protect the warhead-bearing rocket?" He shook his hand again in his gesture of negation. "Oh, never fear, had the arms race of the 1950s and 1960s continued, both sides would have ultimately developed such destroyer escorts of space missile warfare. Now, it would seem, one of The Gaulle's more brilliant minds has devised such a missile today."

"I see," Yuri muttered.

"Your task . . ." his superior began.

IV

Dennis Land, late a professor at the University, late an Etruscanologist of growing repute, stood in the middle of his Mini-Auto-Apartment, his hands thrust deep in trouser pockets. He gazed at the shelves of books and tapes; the desk, still littered with his work; the disorderly piles of notes; the current chapter entitled "The Tarquin Gens and Its Origin." This work was to have made him the world's recognized authority on the subject—he and Academician Updike, of course. Both of their names would have been on the volume. Ronald Updike's, first. Academician Updike, who didn't know an Etruscan from a Carthaginian.

For a long moment he stared into his little, glass enclosed museum. The dozen or so shards of pottery he had picked up personally at Etruscan tomb digs. The small black vase which had been persented to him by Professor Uccello, curator of the Etruscan museum in the Villa Borghese in Rome. The tiny, corroded bronze statue of an Etruscan warrior which Denny had bought at a fabulous price from one of the shady dealers in antiquities whose shops string along the Via Condotti. In spite of the cost, he sometimes had his doubts about the warrior. However, it *made* the museum.

He turned abruptly and took a step to the auto-bar in the corner. A practicing athlete, as well as a scholar, Denny's auto-bar was more for social occasions than solitary drinking, particularly serious solitary drinking. But now he extracted his credit card, put it face down on the small telly-screen, and dialed himself a John Brown's Body. The foot-square serving slot sank into the bar, arose again bearing the fourteen ounce glass, garnished with its mint and half slice of orange.

"The fruit salad," Denny muttered, "will be unneces-

sary." With a finger he fished the mint and orange out of the glass and threw them to the floor. He tilted back the glass, and half emptied it.

But that ended the gesture. His desire to drown his sorrows in alcohol left him; he was too much a realist not to know that they didn't drown, but were pickled. He put the glass down, picked up his credit card and took it to the telly-phone, flicked it on, held the card to the screen and said, "Balance check, please."

After a short moment, the robot voice reported, "Twenty shares of Inalienable common. Six shares of Variable common, current market value thirty-thousand, three hundred and forty-four dollars and eighty-six cents. Current cash credit, three hundred and forty-five dollars and thirty cents." The screen died.

So. He had his Inalienable common stock which guaranteed him an income sufficient to maintain himself decently as a Mid-Middle. He had, besides, his life savings of six shares of Variable common stock, the income from which was enough for emergencies—even marriage. Enough to add those little things to life that counted so much. Rare books, vacation trips, an art object or two, an occasional descent on the flesh pots of the town.

But enough to sponsor his research to the point of a year or so in Tuscany, and then sufficient to publish the heavy tome he'd had in mind? No. Not with prices they were today.

Face reality, Denny Land. As a scholar, you've had it. Sure, you could have fought. Old Updike wasn't the final word. Denny could have taken it to the highest echelons of the Category Education. But where would it have gotten him? You can't fight the establishment. Suppose the higher echelons had reinstated him at the University, re-established his appropriation. Could he have operated in open defiance of his department head? No. Updike, enraged, would have put obstacles in his way which would have made work impossible, and probably would ultimately have found some other reason for dismissing him. As it was, there was a slight chance he might be recalled, in a year or so, after his notoriety had been forgotten. The fracas buffs and gladiatorial fans were short of memory when it came to their heroes.

The telly-phone tinkled and lit up, and Denny sighed and sat to answer it. He didn't recognize the face, but the background was obviously that of an office. She said briskly, "Professor Land?"

"That's right."

"This is the Bureau of Investigation. You are requested to appear in Mr. Hodgson's office at your earliest convenience."

"Bureau of Investigation!" Denny blurted.

"In the Octagon, of course."

"But . . . but what's the charge?"

"There is no charge, professor," she said. The screen died.

Octagon Building? Bureau of Investigation? He?

Dennis Land? He stared at the screen. But it obviously was no hoax. He shook his head, in mystery. Well . . . He reached out to dial a vacuum-tube taxi, not owning a hovercar of his own. He could have rented one, of course, but evidently this Hodgson, whoever he was, was in a hurry, and who wanted to irritate an official of the Bureau of Investigation? Greater Washington was a distance.

By the time he had shrugged into his jacket, a small light had flickered on the closetlike door, set into the wall immediately next to his auto-bar. He opened it and wedged himself into the small vacuum tube two-seater there, bringing the canopy over him and then dropping the pressurizer. He hadn't the slightest idea what to dial, so he ordered vocally into the telly-screen, after pressing his credit card to it.

He could feel the sinking, elevator sensation, which meant his cab was dropping to tube level to be caught up by robot controls and shuttled back and forth through the mazes of vacuum-tube transport labyrinth, preparatory to being shot to his basic destination. After a few moments the taxi came to a halt and Denny closed his eyes in anticipation. He might be one of only eight survivors of the national games, but he hated that initial thrust as much as the next man. No hero he, when it came to roping down a mountain side, parachuting from an aircraft, or facing the sudden nausea of vacuum-tube transport. He wondered if *anybody* ever got used to it.

He sank back into the pressure seat, then slowly forward again, straining against the safety belt. Greater Washington. The shuttling started up again, and he had to go through a few traversing shots, which meant nothing. At last a green light flashed on the dash, and he undid the belt, killed the pressurizer, slid the canopy back, and opened the door to emerge in the king-size reception hall of the hush-hush Bureau of Investigation.

A bright eyed, nattily attired stereotype of a Category Government young man stepped up to him. "Professor Land?" he said.

Denny hadn't expected such immediate recognition. In fact, had steeled himself for an extended period of red tape and being hustled from one desk to another until at long last reaching his destination. Evidently, there was to be none of that. This Mr. Hodgson obviously was really in a hurry to see him. He still couldn't imagine why.

He followed the young man—probably a Bureau of Investigation agent, Denny decided—across the reception hall to a heavy wooden door beyond, through it and down a lengthy corridor. A very lengthy corridor. Oh, it was the Octagon, all right. He wondered vaguely if considerable time wouldn't be saved by having some sort of vehicles in these halls.

He took in his guide from the side of his eyes. He'd heard about the highly trained Bureau of Investigation agents. In fact, he'd seen telly shows based on their activities.

The other surprised him by saying, "Just thought I'd

tell you I wasn't able to get a seat at the amphitheater, but I followed the games on telly. Zen, sir, that was a fight you had with the Dimachaeri on the third day. For a while there, you were really in the dill."

Denny could hardly fail to remember what the other was talking about. Dimachaeri fought with daggers in both hands, a form of gladiatorial combat with which Dennis Land hadn't been very familiar. He'd won out by the skin of his teeth.

However, he was amused inwardly now. At the same moment he had been feeling awe at the other's accomplishments in the way of Bureau of Investigation training as an agent, evidently the agent was feeling awe at him, due to his skill in the use of the weapons of antiquity.

"It's more luck than anything else," he said now. "Lots of men better than I went down in that arena."

"Luck you can always use," the other said, admiration still in his voice. "But luck alone doesn't get you through the finals of the national games. It won't even get you to the finals."

Denny grunted in sour amusement. "I had another ace up my sleeve, I'm afraid. You see, I had access to the greatest library on primitive, ancient and medieval arms and their usage, in the world. Books on Roman military drill, scrolls on actual gladiatorial fights which became classics due to some tactic or other on the part of the participants. In short, when I entered that arena I knew more about the use of the weapons we were carrying, than any other man present."

Denny paused, then added, "However, I still needed the luck."

They had pulled up before a heavy door. His guide knocked, then opened and stood aside for Denny to enter. He didn't follow.

It was a small anteroom, and the woman at the desk was she who had phoned him earlier. She was, to Denny's surprise, evidently a receptionist. A live receptionist, not too young. Offhand, he couldn't think of any task that a robot couldn't fulfill that a live . . . Well, ostentation could be taken just so far. He wondered who this Hodgson could be.

She looked up, her features birdlike. "I'm Miss Mikhail," she said briskly. "Mr. Hodgson is awaiting you, professor. Right through that door, there."

Denny said, "Thank you," even while feeling the words inane. Thus far, he knew of no reason to thank anybody involved in this. He had been brought, at his own expense, hundreds of miles for some cause he knew nothing about. In fact, as a citizen in good standing of the West-world and the Welfare State, he wondered if he shouldn't be getting indignant in here somewhere.

He opened the inner door, closed it behind him.

Jesus Gonzales said, "Hi Denny."

Dennis Land stared at him. "Zero! Are you . . ."

"Am I Hodgson? Me?" Zero laughed. "Mr. Hodgson, may I introduce Dennis Land, Category Education, Sub-

division History, Branch Research, Rank Professor, Mid-Middle." He waved a hand in the direction of the other side of the room. "Denny, meet Frank Hodgson, Category Government, Sub-division Bureau of Investigation, Rank Secretary . . ."

The surprise at seeing Zero Gonzales had prevented Denny from noticing the tall older man who stood there, looking at him questioningly. He had a strange stance, carrying one shoulder considerably lower than the other. He also had a heavy office pallor and an air compounded of what would seem artificial languor and actual weariness.

Denny murmured some banality at the introduction, and the other seemed to come to some decision he'd been withholding and came forward, hand outstretched. "Welcome aboard," he said easily, almost lazily.

"Welcome aboard?" Denny said blankly. "Aboard what?"

Zero chuckled, and plunked himself down on one buttock atop the edge of the smaller of the two desks the room held. He said to Hodgson, "Afraid I can't finish your introduction, sir, I don't know what your caste is. High-Middle? Low-Upper?"

"I don't believe I remember," Hodgson murmured easily, even as he made his way around the larger desk and sank into the chair there. He was completely gray of hair and obviously far beyond the age at which most,

in the West-world, retired. With the surplus of manpower that applied, why should anyone continue working beyond the age of forty-five? Frank Hodgson had.

Denny was still staring at the oldster. Didn't remember what his caste level was? Why everybody knew their caste rating; you knew it as well as you did your own name.

Hodgson looked up at him. "Please have a chair, professor." He smiled softly. "I must admit, it is not everyday one meets a professor of anthropology who is at the same time a young man who has just won through the finals of the national games." He held up a hand to cut Denny short. "Zero explained the circumstances under which you were, ah, sucked into the games. But that you were physically qualified at all astonishes me."

Denny shrugged inwardly and found a chair, undoubtedly all this would be cleared up in good time. He said, "My father before me was quite a student of Etruscan, Greek and Roman life. All three of these peoples considered physical attainments as important as mental ones. They did not consider a man wise who devoted full effort to his mind, but ignored his body. My father raised me in that tradition. I've possibly made a fetish, by present standards, of keeping myself fit."

Hodgson was nodding, pleasantly. "Zero told me of your studies of the Etruscans. A fascinating civilization, so I understand."

"My former studies," Denny said sourly. "I have just been given indefinite leave of absence from the University and my appropriation for research has been rescinded."

"I see. As a result of the notoriety you gained by participation in the games, undoubtedly. Possibly we can do something about that at a later date, professor. Ah, I think I shall call you Denny. You seem much too young to carry the heavy rank of professor. At any rate, Denny, what do you think of the theory that the Etruscans established trading stations along the Iberian coast, at what is now known as the Costa del Sol of Spain, even before the Phoenicians or Greeks sailed those waters?"

Denny, in spite of the strangeness of the setting, was indignant. "Ridiculous. The Etruscans were competent seamen, but they established ports no farther from Etruria proper than the town of Luna, in what is now Northern Italy. Liguria, to be exact."

Frank Hodgson smiled gently. "Nevertheless, Denny, we plan to send you on an expedition to Southern Spain to investigate the possibility of such early Etruscan trading stations. Ah, Zero, here, will be your assistant."

Dennis Land was not slow minded. He looked from one of them to the other. "I assume you have some espionage or counterespionage game in mind. I can't imagine why you thought I'd be interested. But whatever the reason, no thank you. I am not interested in cloak and dagger . . ."

Hodgson held up a hand to still him. "Denny, when you signed up for the games, you volunteered, in case of



victory, to remain for one year on call of the West-world . . ."

"Yes," Denny blurted. "But that's in the unlikely case the World Court rules for a trial of combat. Not . . ."

"The West-world is now calling, Dennis Land."

"Don't you think you might ask for volunteers on a . . ."

"We are asking for volunteers, Dennis Land, in the old army method of asking for volunteers. You, you, and you. Your country's situation has pickled, Dennis Land. It needs your services desperately. You are Professor Dennis Land, Etruscanologist, internationally respected in your field. A perfect cover for the mission we depend upon to pull us out of the dill. You also are a perfect physical specimen with abnormally quick reflexes, or you would never have survived the games. The Bureau hasn't another agent with your qualifications, Denny."

"Hey," Zero complained. "I survived the games, too. I keep telling you, Frank, You underestimate me."

His superior snorted. "I ought to have you demoted, you cloddy. You could have gotten yourself killed in that confounded slaughter."

"I told you I'd make it," the other laughed irrepressibly.

"However, you aren't a known historian who might be doing research on the Iberian coast. As an assistant of Professor Land, you'll have some protective coloring. If we sent you alone, someone in that espionage conscious Common Europe would spot you the first week."

Denny Land said impatiently. "I'm simply not available."

The elderly bureaucrat swung to right and left in his swivel chair, his face tolerant. He said, "Listen to my fling before making a decision, Denny."

"I'll listen, but I'm not interested in crossing categories from Education to Government."

"That wouldn't be necessary," Hodgson said easily. "Denny, would you say the world is stable in so far as politico-economics are concerned?"

Denny looked from the older man to Zero, then back again, scowling. "Why, of course. They've been stable for decades, ever since the Universal Disarmament Pact and the establishment of the World Court. The re-establishment of the World Court, I suppose I should say."

Hodgson was shaking his head gently. "No. Popular belief to the contrary, there is no field so fluctuating as that of socio-economic systems. No matter what the surface appearances, there is continual flux. This applies not only to our"—he half-smiled—"People's Capitalism, but to the Sov-world, the Neut-world and, especially at this time, to Common Europe as well."

Denny felt argumentative, though he didn't know why. "I can't see any changes that have taken place in the West-world in my lifetime. And I can't envision any in the immediate future."

"No?" the other's voice was dry. "Let's use but one example, the gladiatorial meets both you and our friend

Zero, here, just came through." Hodgson made himself more comfortable. "As a historian, you will of course, see the parallel between the original Roman games and our own."

Denny said, vaguely unhappy. "The purpose was different. Their games were purely for entertainment of the mob . . ."

Zero chuckled, but said nothing.

"... Ours are for selecting the most competent combat men in the West-world, to defend our cause in case the World Court calls for a trial by combat in some international disagreement."

The bureaucrat was gently shaking his head. "Denny, when the Roman empire evolved to the point that the wealth which poured into Rome was so great its populous need no longer work but existed on free food issued by the government, and the bounty of enormously wealthy patricians who bought their votes, it was found that slobes do not live by food alone. Frustrated by the meaningless, useless lives they led, something else was needed to keep them from explosion."

"Bread and circuses," Zero murmured.

"This is hardly news to me," Denny said in irritation.

"Of course not. The evolution of our own society was foreseen by a good many politico-economists half a century and more ago. Automation, the second industrial revolution, gave us an abundance of food, clothing, shelter, medical care, education, the other necessities and even luxuries, for all. At the same time, fewer and fewer employees were needed in industry, especially unskilled employees. They were soon all but eliminated. To keep these unemployed from starving . . . or from revolt . . . the rapidly evolving Welfare State provided unemployment insurance, pensions, relief, a score of different ways to get something for nothing. And slowly the most incompetent members of our society sank to little more than brute level. Trank was devised to keep them, ah, happy. Telly violence, the final aspects of which could have been seen when the medium first developed, increased and increased again."

The aged bureaucrat twisted his mouth ruefully. "A friend of mine once put it, the jerks had at last inherited the earth. Given safety from reprisal, Denny, the brute will come out in the slob. It's been shown over and over again. One example was the Roman mob and the *ludi*, the games. A more recent example, just in case you're inclined to say, *but that was two thousand years ago*, were the Nazis. Never forget the Nazis. When Hitler gave his people *carte blanche* to dispose of their, ah, racial inferiors such as the Jews, the Poles, the Gypsies, the Slavs, they responded with a vim. Not just individuals, but as a *people*."

Denny said, "If society hadn't first degraded these people, they wouldn't have had the neuroses which demanded sadism to give them the necessary emotional release."

"Are you sure you aren't putting the cart before the horse? At any rate, in our own society their sadistic demands were met in modern fashion. The fracas evolved, fighting between corporations and union, between union and union over jurisdictional squabbles, between competing corporations. Mercenaries were hired to do the fighting, and our modern equivalent of the mob drooled over the violence on their telly sets."

Denny said impatiently, "What's this got to do with changes taking place in the *status quo*, and above all, what's it got to do with me going to Spain?"

The other nodded. "We've got to the point of my example. When you were a lad, Denny, just how big were the gladiatorial meets?"

Dennis Land scowled at him. "Why, I don't even remember . . ."

"Of course not. They're a fairly modern innovation. The fracas got to the point where it took whole divisions to fight one. The country was being bled white, as Rome was once bled white to support its games. So slowly it was realized that we must taper off the fracas, and build up a considerably cheaper method of satisfying our drooling, trunk sucking, potential mob."

"But the World Court . . ."

"Was with us before, too. This method of resolving international problems by resort to trial by combat, is comparatively new. Keep in mind, that it is not just the West-world that needs bread and circuses to keep the mob happy, but the Sov-world, Common Europe and the Neut-world as well. The Sov proletarians, as they call them, also glory in watching telly violence."

"To wrap it up, Denny, the fracas are slowly withering away, their place being taken by gladiatorial combat. Now do you see that changes are taking places in this world of ours?"

The telly screen on his desk lit up, and Denny could see Miss Mikhail's elderly face. She said something and Frank Hodgson said, "Very well, send her in, please."

When the door opened, the three men came to their feet.

Hodgson said, "Bette, may I present Professor Dennis Land. Denny, this is Bette Yardborough, the third member of your expedition to be."

It was a strange introduction, Denny thought. No mention of Category, Sub-Division, Rank, nor even caste. The girl, herself, was quite startling. She, well, *projected* herself. She bore an aura of not exactly excitement, but of energy. Her handshake was firm and decisive and she looked into your eyes when she acknowledged introduction. Looked into your eyes as though attempting to go beyond them and to the inner you. Not that she was unattractive. She was probably in the vicinity of thirty, only two or three inches less than Denny, the athletic, rather than the bedroom type, red of hair, disturbingly green of eye, and small of mouth. The mouth, Denny decided, didn't live up to the rest of her, especially when pursed in exasperation as it was now.

She said brittlely, "A pleasure, professor. I understand that you, as well as this cloddy Zero . . ."

"I surrender," Zero chirped.

"... Participated in that disgusting display of vulgarity last week." Before Denny could answer that, she had spun on Frank Hodgson who had sighed and resumed his chair. "Do I understand that you are sending me to be a junior third member of a team, one of whom has never been on an assignment before?"

Hodgson chuckled in deprecation. "I wouldn't put it that way, my dear. On the surface, Denny will be in command, as Professor Land, doing historical research. Zero will be his self-effacing assistant and you will be his secretary. In actuality you will be working as a trio of equals."

"Who will be in command when decisions involving the assignment are to be made?" she snapped.

The bureaucrat said gently, "I suggest you consider yourselves as a team and utilize the—these days much disparaged—democratic principle."

"Oh, Zen! This will be a project," she snapped, sinking abruptly into the chair Zero held for her.

"Will you marry me, Bette?" Zero murmured.

"Not though they bounced me to Upper-Upper," she snapped back.

"All right, all right," Hodgson said. "You'll have time for horseplay later. We have arrived at the point where you'll wish instructions."

Denny said, "I keep telling you I have no desire to play at cloak and dagger in Spain, or elsewhere."

"Fine," Bette said brittlely. "I can probably handle this much easier if both of you remain right here and play with your swords and spears."

Hodgson said, "Before you came in, Bette, I was proving to Denny that far from the world being stable, it is in a continual condition of flux. Whether we wish it, or nay, socio-economic institutions are ever changing." He twisted his mouth wryly. "The best we can do, is attempt to direct them somewhat."

The three of them realized that he was about to drop a bomb, and he did just that. "It would seem that The Gaulle continues to enjoy the favors of the Goddess of Luck. At a time when his freewheeling economy demands expansion into new markets—new sources of raw materials—he has found a method whereby he can descend upon profitable areas of the Neut-world without risking retaliation by either the West-world or the Sov-world."

Zero said, for once no undertone of amusement in his voice, "Either or both of us would *have* to retaliate. If Common Europe could add the Neut-world to her apron strings, she'd eventually completely dominate. The balance of power would be over."

"Exactly," Hodgson said, nodding. "And The Gaulle knows it. At this point he isn't motivated by that long a range development. It is simply that his economy is on the verge of collapse, on the verge of a depression such as

hasn't been seen since the middle of the Twentieth Century. Depressions are a thing of the past in the West-world, and never applied to the Sov-world, but Common Europe didn't take the same path either of us did."

"What's this method you speak of?" Bette said, worry in her voice, now.

"An off-beat research engineer, you might call him, a certain Auguste Bazaine, a Belgian, has devised a workable anti-anti-missile. With it, The Gaulle could defy the World Court and world opinion. Both the West-world and the Sov-world, lacking such a weapon in their arsenals, would have to stand to the side while he carved out what portions of the Neut-world he desired. By the time we could develop our own, we would be faced with a *fait accompli*."

The bureaucrat swung in his swivel chair, to left and right, slowly, though thoughtfully. "The thing is that some sort of wheel has come off in The Gaulle's plans, according to our Paris agents. This Auguste Bazaine evidently refuses to communicate with governmental officials of Common Europe. It is the unsupported suspicion of our agents already there, that Bazaine alone has the complete know-how for constructing his anti-anti-missile, and is being temperamental."

"Soooo . . ." Zero said.

"So you are to repair immediately to Barcelona. There we have hired a small sailing yacht which you will take down the Spanish coast to Torremolinos, where Bazaine is sulking. You will stop very-briefly at say, Tarragona and Cartagena, as though testing the possibility of Etruscan merchant ports having been established at those points, before the arrival of the Greeks or Phoenicians. However, you will get to the Malaga area as quickly as feasible and make contact with Auguste Bazaine."

Bette said, frowning, "I thought you said he'd gone to earth. Had dug sort of a hole and pulled it in after him."

Hodgson was nodding. He looked at Denny. "It would seem that friend Bazaine is an amateur anthropologist himself, specializing in Phoenicians and Carthaginians. I trust your mutual interests may prove an in."

Zero said, "All right. So we get to this mad-scientist type, whose new device could set the whole world off, eventually. Then what do we do?"

Hodgson looked at him dryly, "I hardly expected that question from you, my impetuous Zero. You work off the cuff, of course. If you can simply steal his blueprints, if there exists such items, do so. Given such a set of his plans, we once again are in balance of power. If there are no such plans, perhaps kidnaping might be in order. You will have the yacht, which is large enough for sea voyages, and the crew, competent agents. If neither is feasible . . . well, Auguste Bazaine is expendable in this world of ours."

"Oh, great," Zero muttered.

Denny said, "I haven't agreed . . ."

Hodgson looked at him impatiently. "What is the

name of your superior in Category Education who had you dismissed, Denny?"

"Updike. Academician Ronald Updike."

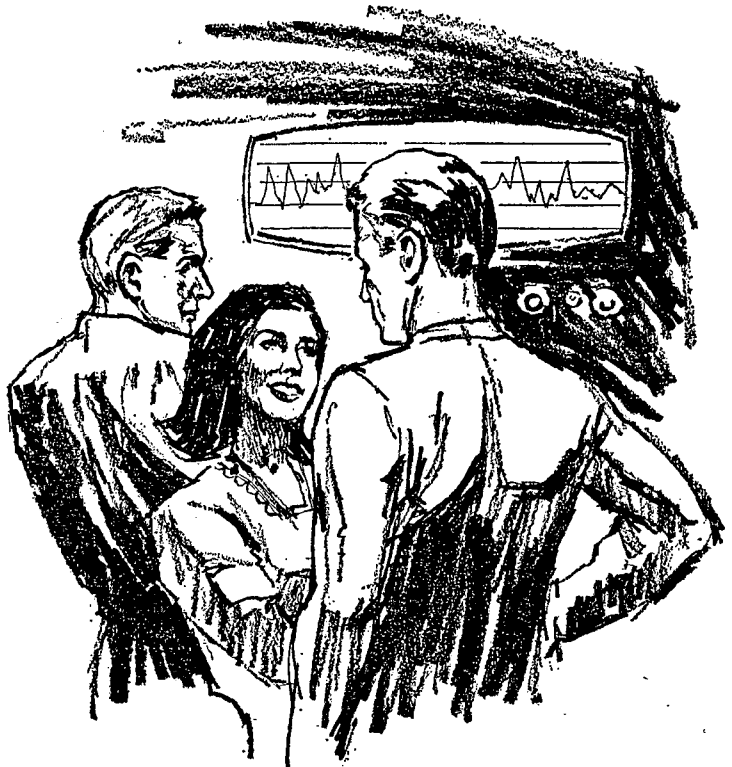
"Very well. Upon your return, following successful termination of your assignment, steps will be taken to have you reinstated, and possibly take over the seat of this academic foe of yours."

Denny stared at him. "Updike's a Low-Upper."

Hodgson said confidently. "We'll find a way. Are you in Denny?"

"I'm in," Denny said lowly, after only brief consideration.

The aged bureaucrat looked suddenly very tired. "Very well. Miss Mikhail will give you some details. Zero will see to your equipment, Denny. You'll leave for Barcelona to join your yacht, soonest."



They stood to go.

Hodgson said, "Just one other thing. The information may be incorrect, but the grapevine has it that Yuri Malyshev has been given the same assignment you have. That is, to get to this temperamental Bazaine before The Gaulle makes his peace with him."

Zero hissed through his teeth, unhappily.

"Who's Yuri, whatever his name is?" Denny growled.

Bette said slowly, "The most competent, and certainly the most ruthless, uh, hatchetman they used to call them, of the *Chrezvychainaya Komissiya*."

"What's that?"

Zero chuckled sourly. "It's the same as this department, only without a conscience. They lost it, some seventy-five years ago."

Hodgson finished with. "I needn't tell you what it

would mean for the Sov-world to have the anti-anti-missile, while we didn't."

V

The three of them spent an hour or two with Miss Mikhail, who, evidently, Denny Land decided, was much more than the traditional office receptionist. He wondered, vaguely, what her category, rank, and caste would prove to be, but didn't ask. This Bureau of Investigation seemed to be the most slipshod project with which he had ever become acquainted. However, even in its lack of what could be called system and discipline, there was an elusive efficiency at work. For instance, Miss Mikhail had already made arrangements on the rocket-plane for passage to Barcelona, and evidently the yacht which they were to use in the supposed exploration of the Iberian coast was already crewed and waiting. On the face of it, Frank Hodgson had not even considered the possibility that Denny would absolutely refuse to go on this mission.

They spent an hour or two with Miss Mikhail, getting details, and then Zero, grinning at them both, said he had some odds and ends of jobs that he had to clear up before leaving, and that for Denny to be good and not to take advantage of his absence to get next to the woman he loved.

Bette, snorted indignation. "Over-trunked again," she snapped. "Delusions of grandeur."

Zero waved, and was gone.

Denny looked at her. He'd better make his peace with this fireball of feminism-rampant. He was going to have to bear her company for possibly the next couple of months, like it or not. He simply was not so constructed as to be able to continue the running raillery that seemed to exist between her and Zero. He wondered what their actual feelings toward each other were.

He nodded after the other, when he had gone. "Quite a guy," he said, letting the words mean anything.

Bette Yardborough surprised him by saying, "Don't get a wrong impression of Jesus Gonzales. He's the second best agent in this bureau."

"Second? Who do you consider the best man?"

"The best agent. The best agent isn't a man. It's me."

"Oh," Denny said. He hadn't quite got the grammar, but the idea came through. He said, "What say we go for a drink somewhere, and discuss this whole project further?"

She looked at him and said suspiciously, "I don't suppose you're the amorous kind."

"Only on occasions other than this type," Denny said stiffly. "I'm new to the field, and admittedly a bit nervous."

"All right, let's go. There's a bar in B.12 corridor that makes the best Far Out Coolers in Greater Washington."

Denny let her lead the way for a moment, then caught up. Behind her, he couldn't keep his mind on their assignment, and he didn't want her to get a hold on him, cer-

tainly not so soon in the game. Denny Land was susceptible enough to feminine attractions, but the project they were embarked upon didn't allow for dalliance.

At the auto-bar, they found a table easily enough at this time of day, and before Denny could bring his own credit card forth she had slipped hers on the telly-screen, and dialed two Far Out Coolers. She muttered, "I sometimes wonder about this complete elimination of coinage. For even the tiniest of purchase, you use your credit card. Can you imagine the number of telly-screens and computers involved in reading your card and deducting from your account, even, say, the purchase of a single aspirin? Why not have at least minor coins?"

Denny shrugged. The question had never occurred to him. The use of the universal credit card had been with him all his life. He said now, disinterestedly, "It's all done by automation, so the amount of work involved isn't particularly important. Besides, the moment you have actual legal tender, it can be lost, stolen, conned away from you, gambled away from you, and so forth and so on. Each month, my dividends are deposited to my account. Only I can spend them, and on whatever I wish. My rent, my utilities, all those basic expenses are automatically taken out. Zen! It works. Why change it?"

She said impatiently, some of her former brittleness returning. "It seems to be the slogan of our day, *why change it?* However, to get back to Zero. It might do your long-term morale good to realize that Frank Hodgson isn't as easy-goingly gentle as he just loves to project. When he sends a team out, it's composed of just the elements he thinks needed for the job. He's seldom wrong. Zero is unsurpassed as a bureau operative."

Denny said uncomfortably, "But why pick on me?"

"Hodgson told you. First, your perfect camouflage, second, your proven ability in action. But third, probably most important of all, as an archaeologist dealing with Bazaine's favorite period, you'll probably open gates to get to him."

He looked at her anew, realizing, as though for the first time, how really pretty a girl she was. No, not pretty—beautiful. There's a considerable difference. It came out without his thinking, when he said, "That accounts for Zero and me. How about you?"

Her mouth tightened, but then relaxed and took on an impatient twist. "You might have figured that out for yourself. If I know Frank Hodgson, he decided we needed an extra *in*, in case your fling pickled."

Denny frowned at her.

She snapped impatiently, "This Auguste Bazaine has two hobbies, archaeology and mopsies."

Denny was embarrassed at her straightforwardness. He said, "Nobody would say you were a mopsy, Miss Yardborough."

She suddenly smiled, it was the first time he had seen her smile, and then laughed, it was the first time he had heard her laugh. "Wait until you see me go into my act," she said, then added, sober again, "If necessary." She

looked at her watch. "I've got an appointment before too long."

Dennis Land's first impression of Bette Yardborough had been one of dismay. He disliked aggressive, domineering females, his taste running to the placid type. His life had been such that he had found little time to devote to worrying about his sex life and the usual complications involved. He just didn't want to get *embroiled* in emotional situations. He liked quiet girls, good-looking but not necessarily startling beauties; get a great beauty on your hands and, sure as Zen, sooner or later complications arose.

But Bette Yardborough fascinated him. She was obviously a top Bureau of Investigation agent which seemed incongruous at her age, and with her physical qualifications.

She said now, "What was all this about you being dismissed from the University because of participation in the games?"

He gave her a brief rundown on the situation. She had heard Hodgson's promise to have him reinstated, so he didn't have to mention that.

She was indignant. "You mean this Lower-Upper curd had you kicked off the faculty for no other reason than that you had been drafted, in spite of yourself, to fight in the games?"

Denny's eyes had widened. In spite of his scholastic and athletic accomplishments, he had led a sheltered life. Never in his days, had he heard a woman who must have been at least a Low-Middle in caste, use profanity. He wondered if he were blushing.

He said, "That's about it."

"The scum!" she railed. "But it's just what you have to expect. An hereditary aristocracy! Have you ever heard in history, of a hereditary aristocracy that was worth a last year's credit card? Sure, sure, the first generation slugs its way to the top. He's an outstanding warrior, or possesses an unusually agile mind. Then the second generation comes along, inheriting the old boy's titles, position and wealth, and he's a second rater, raised by his father, but shaded by him. Then comes the third generation, and he's a molly. By time you get to the fourth generation, you get types with the hemophilia of the Romanoffs, the withered arm of the Kaiser, the chinless wonders of the Hapsburgs; Zen knows what their brains were like."

Denny was bug-eying her. Never in his career had he heard this open an attack on the caste system of the West-world. Not even as an undergraduate, that freest of life's periods.

He cleared his throat and said mildly, "There have been examples of remarkable ability being handed down from one generation to another. For instance, Philip of Macedon, a military genius, and his son, Alexander, an even greater one."

She turned her wrath to him. "Trying to find excuses

for the very cloddies who exploit you, eh? Anything to maintain the *status quo*, eh? Don't rock the boat, something worse might happen to us. So far as Alexander is concerned, I've often wondered. At a time when the Persian Empire was on the verge of collapse, depending on hired Greek mercenaries to defend it, Philip trained the most competent army the world had yet seen, and developed such top general officers as Parmenion, Nearchus and Antipater. Alexander inherited it, and the decadent Persians fell apart before him. But how much did he really have on the ball? And what happened to *his* children, this third generation of Macedonian aristocrats?"

"They had their throats slit," Denny admitted. He didn't know how they got on this kick.

Evidently, neither had she. But now she said, "I'm afraid I've got an appointment, Dennis. I'll have to go. As I understand it, we meet tomorrow at Zero's place all ready to depart for Barcelona." She arose.

"That's right." He came to his feet, too. "Mind showing me the nearest vacuum-tube pick-up? I'll have to get back to my place, pack and make various arrangements."

"Come along," she said briskly, but pleasantly.

Bette Yardborough, Denny decided, could turn the charm on and off like a faucet. He shuddered, inwardly, at the thought of being married to her, even as he hurriedly followed after.

Bette had turned out of the small auto-bar, into the main Octagon corridor beyond. Out of his sight, for a moment, Denny sped up to catch her. Sped up and caromed off a pedestrian hurrying along on his own business.

"Ooops, sorry friend," Denny blurted. He caught the other, to steady him, then let go and turned to follow Bette.

"Just a moment, *friend*," the other rasped.

Denny turned back, in a sweep of the eyes taking in the well-cut material of the other's dress, the air of arrogant indignation. The . . . Well, what is it that the born aristocrat has which types him wherever and whenever?

Oh, oh.

"Have you no regard for your betters? No respect for the color of my shirt!"

Oh, oh. Thus far Denny had failed to note that. The blue shirt. Symbol of labor. Not only was the other an Upper, but a labor leader as well, the touchiest, most class conscious of them all.

Bette Yardborough had returned. The charm was turned on at full blast, a Niagara of charm. "Oh, sir, it's all my fault. Bette Yardborough, Category Government, Sub-division Bureau of Investigation, Rank Special Agent, Upper-Middle. Professor Land here, the hero of the national games, has been given an assignment with our department. I'm afraid we're in such a rush . . ."

He was not even partially placated. Denny could tell

from the sheen of his eyes that the other had been taking mescaltranc, even at this hour of the day. It didn't help his disposition, though it should have. Possibly he was tapering off after a long binge.

He was rasping now. "Some examples should be made of you brash young Middles—I assume you're a Middle, you act more like a slum element Low-Lower—who make some ridiculous pretention to notoriety and seem to think that automatically runs you up several castes. Let me tell you, young man, bluffing your way through the national games does not put you on a basis where you can brush citizens of Upper caste from your path."

Denny wet his lips. "No, sir. It was entirely inadvertent. I . . ."

"The dignity of labor has been forgotten in this benighted country. Let it be known that I'm David Hoffaman the sixth, Mid-Upper, Category Transportation, Rank Labor Leader, and I demand I be treated with the respect due me!"

"Sir, I . . ." Denny began.

"Sir, I am sure . . ." Bette said, smiling her all but cringing self-deprecation.

"No, no, you've made it clear how little respect you have for the institutions of the West-world. Let me have your full name, category and rank. We'll just see how a drop of a caste or so will influence your outlook, young man."

That was all he needed. Reduction in caste to Upper-Lower, or wherever. With that, he could never aspire to a professorship again, not to speak of an appropriation for historical research. However, Denny sighed and said,

"Dennis Land, Category Education, Subdivision History, Branch Research, Rank Professor, Mid-Middle Caste."

The other, still in a rage, was noting it down. "Professor indeed. Mid-Middle indeed. A gladiator, I understand. A ruffian, fit only to participate in the games. We'll just investigate these ranks and castes of yours, professor."

Bette said urgently, "But sir, the professor is on a particularly urgent mission for the Bureau . . ." She was all but fawning on the indignant smaller man.

He said, snapping arrogance, "You're both dismissed!"

They turned and left.

Denny's face was gray. Bette's eyes blazed.

When they had got beyond voice range of the feisty little man, Denny blurted. "A parasite. Of all the useless members of present-day society, it's a labor leader. At long last, labor, as known in the old days, has been eliminated. Scientists and highly trained technicians handle, for all practical purposes, *all* the human effort needed in industry. Labor has finally got to the point where even the position of labor leader is featherbedding. Let's face reality, Bette. We've got to the point where not only are the Lowers no longer useful members of society, but neither are the Uppers! We Middles do everything needed to produce the West-world's needs."

She looked at him, her eyes still blazing their resentment of the situation they'd just been subjected to. "Do you really mean that!"

"Of course I mean it!"

"All right, Zen take it. Come along with me. I told you that I had an appointment."

the analytical laboratory

This department is, of course, made up on the basis of votes that readers send in (and please do send in votes! Any handy postcard will do.), and is of the greatest interest to our authors, as well as to readers. The story readers vote to first place gets a 1¢ per word bonus; second place earns the author a 1/2¢ a word bonus. Wherefore—if an author's done you the favor of entertaining you—do him the favor of voting him a reward!

The July issue votes came out in a somewhat unusual way. First and second place were very definite—but third place was a dead-heat tie even if we carried the point-score to four (unjustifiable) places!

PLACE	STORY	AUTHOR	POINTS
1.	Sleeping Planet (Pt. 1)	William F. Burkett Jr.	1.42
2.	The Master Key	Poul Anderson	2.17
3.	Tied:		
	The Sea-Water Papers	Raymond F. Banks	3.32
	A Day in the Life Of Kelvin Throop	R. A. J. Phillips	3.32

THE EDITOR.

He frowned, some of his ire leaving him. "Come along to where?"

"You'll see."

By routes that only later occurred to him were somewhat devious she led him, eventually, to what would seem to be a neighborhood games room, in what was probably a Low-Middle section of town. Low-Middle, barely above Lower caste. He wondered at her interest or her acquaintance with such a neighborhood. He seemed to recall that she had mentioned she was Upper-Middle herself. Just one level below the exalted position of Upper.

Cast in the Welfare State, the West-world, went, from bottom to top: Low-Lower, Mid-Lower, Upper-Lower; then, Low-Middle, Mid-Middle, Upper-Middle; and finally, Low-Upper, Mid-Upper, and the very top of the totem pole, Upper-Upper. The Low-Lowers were the dregs of society, the unneeded, unwanted, the criminal elements, to the extent crime existed at all any more, the beaten by life, the misfits.

Roughly, the Uppers consisted of less than one per cent of the population; the Middles of perhaps nine per cent; the Lowers of ninety per cent. No longer did Lower caste mean want so far as the basics of life was concerned. But on the other hand, existence was not exactly affluent. There were those amongst the Uppers and even the Middles who contended that a higher living standard for the Lowers would be meaningless to them. Why give a beer drinker a vintage year Burgundy? He prefers beer. Why give a potatoes-and-meat man, *Canard Nantais de Colette*? He would much prefer a steak, well done at that.

Be that as it may, Bette Yardborough took him to an area of town that could rate no more than Low-Middle, led him through some labyrinth turns, probably, he decided, to confuse him to the point of not being able to find the place again. They entered a community building, and finally approached a guarded door.

To the man at the door, a somewhat nervous, wizened little type, Denny thought, she said, "Progress!"

"It must be resumed," he told her, saying the words as though he had repeated them a thousand times over. He opened the door.

Bette and Denny entered a room containing some hundred folding chairs, and possibly thirty people occupying them. A speech was going on, and as they found seats, several of the audience hissed them to silence.

The speaker, a man somewhere in his fifties, spoke intimately, sincerely, rather than with ardor.

He was saying, "Consider these statistics, citizens. In my youth, the Uppers consisted of nearly two per cent of the population, approximately four million persons. Today, in spite of population growth, they number considerably less than one per cent, and some two and a half million persons. During that same period, the Middles have grown a bit in percentage, admittedly, but the Lowers are not too far different."

Denny whispered to Bette, "What in Zen is this all about?" He felt a certain trepidation.

"Shush," she said. "You'll see." She herself was leaning forward, her eyes shining, and obviously anxious to follow the other's words.

The speaker was saying. "It's an old, old proverb, fellow citizens. The rich get richer, and the poor get poorer. Speaking percentage-wise, it is still so. The vise is tightening. In the early days of the Welfare State, supposedly anyone, on his own ability, could rise to the ranks of the Uppers. But slowly, slowly, the avenues have been squeezed shut. Until today, do you realize, *a new Upper has not come from the ranks of the Middles for three full years!* The truth is manifest. The Uppers, have frozen the *status quo*. Their children become Uppers, receive Upper education, Upper privileges, but so far as allowing their despised underlings to ever aspire to their positions of opulence and power, they have closed the gates."

Denny whispered to her, "He can't say that. Category Security will be down on this gathering like a ton of bricks. We'd better get out of here, Bette."

"Oh, don't be a funkier, sit still. Allow yourself to hear something new for a change. These Sons of Liberty meetings are held all over the country."

"Sons of Liberty?" he said blankly.

One of their neighbors was angrily hushing them, but Bette said, "Good Zen, Dennis. Have you been so wrapped up in that Ivory Tower of yours that you didn't realize there was an active underground in this country?"

Wide-eyed, now, Denny went back to the speaker. "All our instincts are against change. Change means upset of whatever security we have accumulated. Change means unknown problems to face. Besides our instinctive fears of it, all the means of molding public opinion have been utilized from our very births to disparage change. Our children, hardly before they are out of the cradle, learn slogans such as *You mustn't speak against the government*, and *What was good enough for daddy is good enough for me*.

"But there comes a time when the *status quo* becomes intolerable, when no matter what our instincts, no matter what our deepest training, we are forced to change. Our world, fellow citizens, is in full stagnation. A major percentage of our population, an overwhelming percentage, is either completely unutilized, or working at nothing-jobs, make-work jobs. Whatever happened to our dreams of conquering space? What foundered all the projects of the late Twentieth Century? Well, one thing that foundered them was that such projects threatened the *status quo*. When you start such major developments, you never know where they might end.

"It is something like the old wars. You started a war, with definite aims in view, but before it terminated, you might end up with anything. Take World War One. The powers launched into the conflict over issues involving foreign trade, sources of raw materials. Germany wanted

her place in the sun, equal to France and England, who had launched into colonialism centuries before the Germans got going. But I doubt if any of the powers involved realized that before the war was through, half the crowns of Europe would be rolling in the dust, and nobody to pick them up. Above all, the Russian bear had overthrown the old and was embarked on a new and frightening theory of socio-economics."

Bette whispered to Denny, "Well put."

The speaker went on. "Now, our present regime, our Upper Uppers in control, wants no new startling developments, either political or scientific, which might start a snowball rolling that they could never stop. Thus all is clamped down. All that makes any difference. Fellow citizens, let us face reality. We must organize to overthrow the Welfare State if man is to resume his march of progress. Certainly, his destiny is not to stagnate, fuzzy with trunk pills and spending the greater part of his waking hours staring at telly, and particularly the gladiator games and fracasas which are the most popular programs by far. No, we must organize. Organize behind the banner of the new Sons of Liberty and . . ."

And then there was a scuffling outside, three shots, probably from a revolver, and somebody shouted from the door. "You're all under arrest! This meeting is under arrest for subversion. Any resistance will be met with whatever measures are necessary!"

"Holy Zen!" Denny snapped, immediately the man of action. "Let's get out of here. If we're taken in, we'll be bounced down to Low-Lower!"

Miraculously, there was a tiny automatic in Bette Yardborough's hand. "Get out how?" she muttered, but without a tremor in her voice.

The room was in complete confusion and Category Security men, in uniform and heavily armed, were pouring in from the entry through which Denny and Bette had come, not fifteen minutes before.

"Come on," he snapped, "there must be at least one rear entrance. Some way to get down to the cellar, or up to the roof. Let's go." He led the way, as though a quarterback going through a broken field, pushing the members of the audience this way and that, as they milled about indecisive themselves. Bette, as cool as he was, was immediately behind. He had no doubt whatsoever that she was perfectly competent and willing to use the vicious little gun she carried.

There was indeed a rear door. In fact, two of them. There was no reason to spend time debating which one to take. Denny made a snap judgment and pushed through the left one, Bette still behind. He wondered if the speaker, and the members of the committee who had been sitting behind that worthy, had managed to escape. If so, he didn't see which way they had gone. At any rate, he took the door to the left, moving fast. In a moment he had dropped the personality of the member of an audience, listening to a lecturer, and become the lithe, quick reflexed athlete who had won through, by his own abilities, to the

final gladiatorial games of the whole nation.

There was a corridor beyond. A long and empty corridor, with another door at the far end.

"Let's go!" he yelled at her over his shoulder.

Just as they reached the far end, they could hear the door behind them open, and a voice yelled, "Halt, or I fire! Category Security commands you."

Bette, cool as sherbert, whirled and flicked two shots into the woodwork, not half a dozen inches above the other's head. That worthy gasped, darted his eyes up at the near miss, made a quick retreat slamming the door behind him.

Bette made a contemptuous moue. "Funker," she muttered.

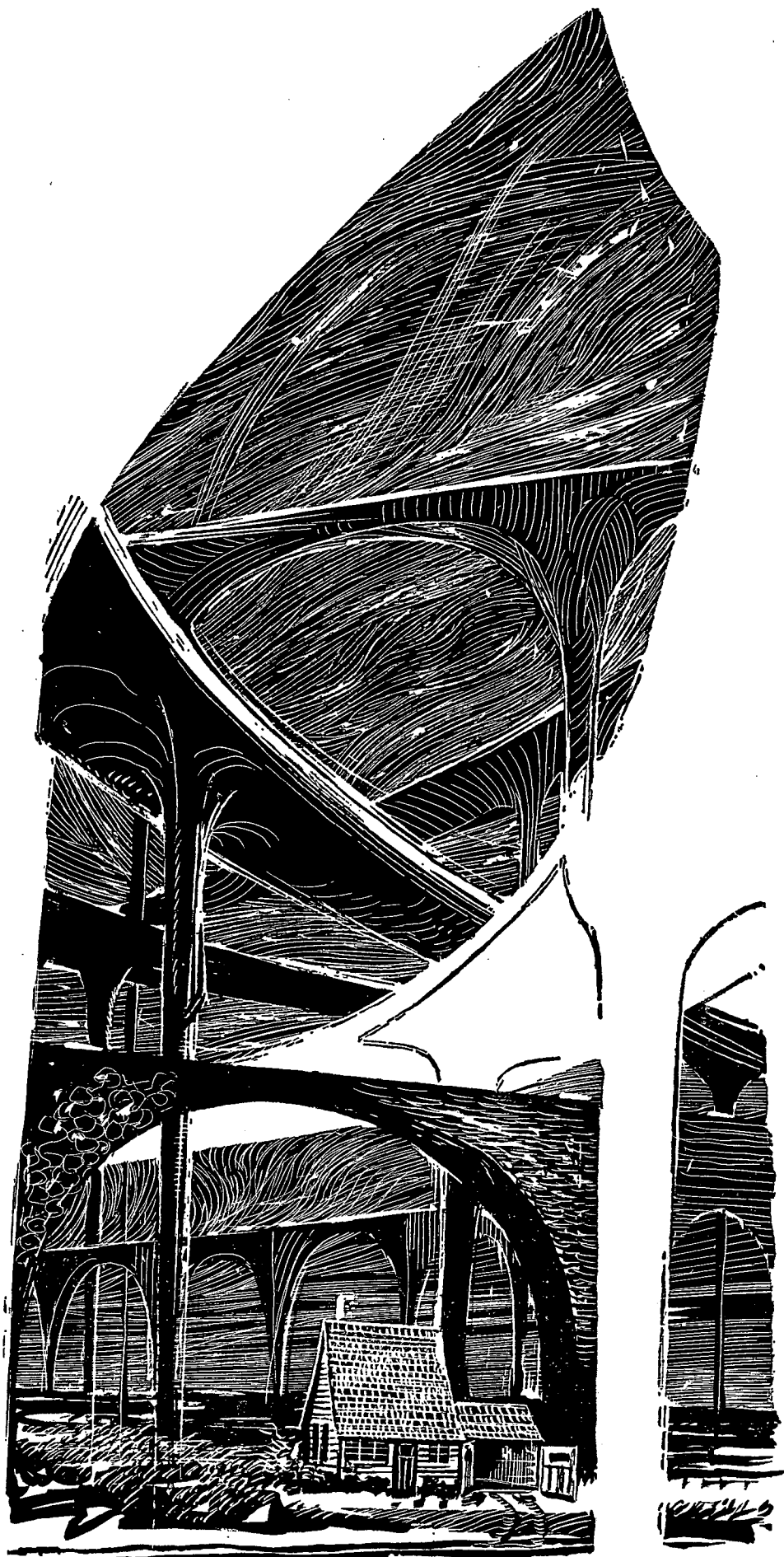
Denny had the door open. There was another corridor beyond, one lined with a succession of doors. He began to snap, "Let's hurry . . ."

But another voice interrupted, pleasantly. "All right, you two. You're under arrest for subversion. Drop that gun, sister!"

Bette blurted, "Zero!"

(To be continued)





THE MARY CELESTE MOVE

Frank Herbert

People don't ordinarily
just suddenly leave their homes,
businesses . . . everything . . .
and never return. Death, of course,
is one reason for doing so.
But there can be another . . .

ILLUSTRATED BY JOHN SCHOENHERR

Martin Fisk's car, a year-old 1997 Buick with triple turbines and *jato* boosters, flashed off the freeway, found a space between a giant mobile refueling tanker and a commuter bus, darted through and surged into the first of the eight right-hand lanes in time to make the turnoff marked "NEW PENTAGON ONLY—Reduce Speed to 75."

Fisk glanced at his surface/air rate-of-travel mixer, saw he was down to 80 miles per hour, close enough to legal speed, and worked his way through the press of morning traffic into the second lane in plenty of time to join the cars diverging onto the fifth-level ramp.

At the last minute, a big official limousine with a two-star general's decal-flag on its forward curve cut in front of him and he had to reduce speed to 50, hearing the drag-bar rasping behind him as his lane frantically matched speed. The shadow of a traffic copter passed over the roadway and Fisk thought: *Hope that general's driver loses his license!*

By this time he was into the sweeping curve-around that would drop him to the fifth level. Speed here was a monitored 55. The roadway entered the building and Fisk brought his R-O-T up to the stated speed watching for the code of his off-slot: BR71D_a. It loomed ahead, a flashing mnemonic blinker in brilliant green.

Fisk dropped behind an in-building shuttle, squeezed into the right-hand lane, slapped the turn-off alert that set all his rim lights blinking and activated the automatics. His machine caught the signal from the roadway, went on automatic and swerved into the off-slot still at 55.

Fisk released his control bar.

Drag hooks underneath the Buick snagged the catch ribbands of the slot, jerked his car to a stop that sent him surging against the harness.

The exit-warning wall ahead of him flashed a big red "7 SECONDS! 7 SECONDS!"

Plenty of time, he thought.

He yanked his briefcase out of its dashboard carrier with his right hand while unsnapping his safety harness with his left and hitting the door actuator with his knee. He was out onto the pedestrian ramp with three seconds to spare. The warning wall lifted; his car jerked forward into the down-elevator rack to be stored in a coded pile far below. His personal I-D signal to the computer-monitored system later would restore the car to him all checked and serviced and ready for the high-risk evening race out of the city.

Fisk glanced at his wrist watch—four minutes until his appointment with William Merrill, the President's liaison officer on the Internal Control Board and Fisk's boss. Adopting the common impersonal discourtesy, Fisk joined the press of people hurrying along the ramp.

Some day, he thought, I'll get a nice safe and sane job on one of the ocean hydroponic stations where all I have to do is watch gauges and there's nothing faster than a 40 mph pedestrian ramp. He fished a green pill out of his coat pocket, gulped it, hoped he wouldn't have to take

another before his blood pressure began its downslant to normal.

By this time he was into the pneumatic lift capsule that would take him up in an individual curve to easy walking distance from his destination. He locked his arms on the brace bars. The door thumped closed. There was a distant hiss, a feeling of smooth downward pressure that evened off. He stared at the familiar blank tan of the opposite wall. Presently, the pressure slackened, the capsule glided to a stop, its door swung open.

Fisk stepped out into the wide hall, avoided the guide-lanes for the high-speed ramp and dodged through thinning lines of people hurrying to work around him.

Within seconds he was into Merrill's office and facing the WAC secretary, a well-endowed brunette with an air of brisk efficiency. She looked up from her desk as he entered.

"Oh, Mr. Fisk," she said, "how nice that you're a minute early. Mr. Merrill's already here. You can have nine minutes. I hope that'll be enough. He has a very full schedule today and the Safety Council subcommittee session with the President this afternoon." She already was up and holding the inner door open for him, saying: "Wouldn't it be wonderful if we could invent a forty-eight hour day?"

We already have, he thought. *We just compressed it into the old twenty-four hour model.*

"Mr. Fisk is here," she said, announcing him as she stepped out of his way.

Fisk was through to the inner sanctum then, wondering why his mind was filled with the sudden realization that he had driven out of his apartment's garage lift one hundred miles away only thirty-two minutes before. He heard the WAC secretary close the door behind him.

Merrill, a wiry redhead with an air of darting tension, pale freckled skin and narrow face, sat at a desk directly opposite the door. He looked up, fixed his green eyes on Fisk, said: "Come on in and sit down, Marty, but make it snappy."

Fisk crossed the office. It was an irregular space of six sides about forty feet across at its widest point. Merrill sat with his back to the narrowest of the walls and with the widest wall at an angle to his right. A computer-actuated map of the United States covered that surface, its color-intensity lines of red, blue and purple showing traffic density on the great expressway arteries that crisscrossed the nation. The ceiling was a similar map, this one showing the entire western hemisphere and confined to the Prime-1 arteries of twenty lanes or greater.

Fisk dropped into the chair across the desk from Merrill, pushed a lock of dark hair back from his forehead, feeling the nervous perspiration there. *Blast it!* he thought. *I'll have to take another pill!*

"Well?" Merrill said.

"It's all here," Fisk said, slapping the briefcase onto Merrill's desk. "Ten days, forty thousand miles of travel

and eighteen personal interviews plus fifty-one other interviews and reports from my assistants."

"You know the President's worried about this," Merrill said. "I hope you have it in some kind of order so I can present it to him this afternoon."

"It's in order," Fisk said. "But you're not going to like it."

"Yeah, well I was prepared for that," Merrill said. "I don't like much of what comes across this desk." He glanced up suddenly at a strip of yellow that appeared on the overhead map indicating a partial blockage on the intercontinental throughway near Caracas. His right hand hovered over an intercom button, poised there as the yellow was replaced by red then blue shading into purple.

"Fourth problem in that area in two days," Merrill said removing his hand from the button. "Have to work a talk with Mendoza into this morning's schedule. O.K." He turned back to Fisk. "Give me your economy model brief rundown. What's got into these kooks who're moving all over the landscape?"

"I've about twenty interlocking factors to reinforce my original hunch," Fisk said. "The Psych department confirms it. The question is whether this thing'll settle into some kind of steady pattern and even out. You might caution the President, off the record, that there are heavy political implications in this. Touchy ones if this leaks out the wrong way."

Merrill pushed a recording button on his desk, said: "O.K., Marty, put the rest on the record. Recap and summarize. I'll listen to it for review while I'm reading your report."

Fisk nodded. "Right." He pulled sheaves of papers in file folders out of the briefcase, lined them up in front of him. "We had the original report, of course, that people were making bold moves from one end of the country to the other in higher than usual numbers, from unlikely starting places to unlikelier destinations. And these people turned out to be mostly mild, timid types instead of bold pioneers who'd pulled up their roots in the spirit of adventure."

"Are the psych profiles in your report?" Merrill asked. "I'm going to have a time convincing the President unless I have all the evidence."

"Right heré," Fisk said, tapping one of the folders. "I also have photostats of billings from the mobile refueling tankers and mobile food canteens to show that the people in these reports are actually the ones we've analyzed."

"Weird," Merrill said. He glanced at another brief flicker of yellow on the overhead map near Seattle, returned his attention to Fisk.

"State and Federal income-tax reports are here," Fisk said, touching another of the folders. "And, oh yes, car ownership breakdowns by area. I also have data on driver's license transfers, bank and loan company records to show the business transactions involved in these moves. You know, some of these kooks sold profitable busi-

nesses at a loss and took up different trades at their new locations. Others took new jobs at lower pay. Some big industries are worried about this. They've lost key people for reasons that don't make sense. And the Welfare Department figures that . . ."

"Yeah, but what's this about car ownership breakdowns?" Merrill asked.

Trust him to dive right through to the sensitive area, Fisk thought. He said: "There's a steep decline in car ownership among these people."

"Do the Detroit people suspect?" Merrill asked.

"I covered my tracks best I could," Fisk said, "but there're bound to be some rumbles when their investigators interview the same people I did."

"We'd better invite them to review our findings," Merrill said. "There're some big political contributors in that area. What's the pattern on communities chosen by these kooks?"

"Pretty indicative," Fisk said. "Most of the areas receiving a big influx are what our highway engineers irreverently call 'headwater swamps'—meaning area where the highway feeder routes thin out and make it easy to leave the expressways."

"For example?"

"Oh . . . New York, San Francisco, Seattle, Los Angeles."

"That all?"

"No. There've been some significant population increases in areas where highway construction slowed traffic. There've been waves into Bangor, Maine . . . Blaine, Washington . . . and, my God! Calexico, California! They were hit on two consecutive weekends by one hundred and seventy of these weird newcomers."

In a tired voice, Merrill said: "I suppose the concentration pattern's consistent?"

"Right down the line. They're all of middle age or past, drove well preserved older cars, are afraid to travel by air, are reluctant to explain why they moved such long distances. The complexion of entire areas in these headwater regions is being changed. There's sameness to them—people all conservative, timid . . . you know the pattern."

"I'm afraid I do. Bound to have political repercussions, too. Congressional representation from these areas will change to fit the new pattern, sure as hell. That's what you meant, wasn't it?"

"Yes." Fisk saw that he only had a few minutes more, began to feel his nervousness mount. He wondered if he'd dare gulp a pill in front of Merrill, decided against it, said: "And you'd better look into the insurance angle. Costs are going up and people are beginning to complain. I saw a report on my desk when I checked in last night. These kooks were almost to a man low-risk drivers. As they get entirely out of the market, that throws a bigger load onto the others."

"I'll have the possibility of a subsidy investigated," Merrill said. "Anything else? You're running out of time."

Running out of time, Fisk thought. *The story of our lives*. He touched another of the folders, said: "Here are the missing persons reports. There's a graph curve in them to fit this theory. I also have divorce records that are worth reviewing—wives who refused to join their husbands in one of these moves, that sort of thing."

"Husband moved and the wife refused to join him, eh?"

"That's the usual pattern. There are a couple of them, though, where the wife moved and refused to come back. Desertion charged . . . very indicative."

"Yeah, I was afraid of that," Merrill said. "O.K., I'll review this when . . ."

"One thing more, Chief," Fisk said. "The telegrams and moving company records." He touched a thicker folder on the right. "I had photocopies made because few people would believe them without seeing them."

"Yeah?"

"The moving company gets an order from, say, Bangor, to move household belongings there from, for example, Tulsa, Oklahoma. The request contains a plea to feed the cat, the dog, the parrot or whatever. The movers go to the address and they find a hungry dog or cat in the house—or even a dead one on some occasions. One mover found a bowl of dead goldfish."

"So?"

"These houses fit right into the pattern," Fisk said. "The moving men find dinners that've been left cooking, plates on the table—all kinds of signs that people left and intended to come back . . . but didn't. They've got a name for this kind of thing in the moving industry. They call it the 'Mary Celeste' move after the story of the sailing ship that . . ."

"I know the story," Merrill said in a sour voice.

Merrill passed a hand wearily across his face, dropped the hand to the desk with a thump. "O.K., Marty, it fits," he said. "These characters go out for a Saturday or Sun-

day afternoon drive. They take a wrong turn onto a one-way access ramp and get trapped onto one of the high-speed expressways. They've never driven over 150 before in their lives and the expressway carrier beam forces them up to 280 or 300 and they panic, lock onto the automatic and then they're afraid to touch the controls until they reach a region where the automatics slow them for diverging traffic. And after that you're lucky if you can ever get them into something with wheels on it again."

"They sell their cars," Fisk said. "They stick to local tube and surface transportation. Used car buyers have come to spot these people, call them 'Panics.' A kook with out-of-state licenses drives in all glassy-eyed and trembling, asks: 'How much you give me for my car?' The dealer makes a killing, of course."

"Of course," Merrill said. "Well, we've got to keep this under wraps at least until after Congress passes the appropriation for the new trans-Huron expressway. After that . . ." He shrugged. "I don't know, but we'll think of something." He waved a hand to dismiss Fisk, bent to a report-corder that folded out of the desk and said: "Stay where I can get you in a hurry, Marty."

Within seconds, Fisk was out in the hallway facing the guidelanes to the high-speed ramp that would carry him to his own office. A man bumped into him and Fisk found that he was standing on the office lip reluctant to move out into the whizzing throngs of the corridor.

No, he thought, I'm not reluctant. I'm afraid.

He was honest enough with himself, though, to realize that he wasn't afraid of the high-speed ramp. It was what the ramp signified, where it could carry him.

I wonder what my car would bring? he asked himself. And he thought: *Would my wife move?* He dried his sweating palm on his sleeve before taking another green pill from his pocket and gulping it. Then he stepped out into the hall. ■

in times to come

The lead story in the November issue will be "Gunpowder God," by H. Beam Piper, the first of a new paratime series by Piper, and unique in one respect at least. It's a science-fiction swashbuckler, with battles fought across the landscape of an alien, alternative time-track—but battles you can follow on your own maps! The scene is Pennsylvania, in the year 1964—but on a history-line wherein the Aryan peoples, migrating eastward from north-central Europe, instead of turning south into India, turned northward through China, across the Bering strait, and into America. So a feudal culture exists in their Pennsylvania in their 1964—until Prince Kalvan (lately Corporal Calvin of the Pennsylvania State Police) gets knocked sidewise in time . . .

And Jack Schoenherr has done a cover for it that is going to be fought over for some time. The original that is; it's a dilly, and I can predict with assurance that more than one person's going to be after it!

Plus, of course, the second part of Mack Reynolds' tale of ultra-super multiplex double-cross politics, "Sweet Dreams, Sweet Princes".

THE EDITOR

FLYING FISH

*The highest evolution is that life form
which is most adaptable—which,
among human scholars, is a point
frequently misunderstood . . .*

John T. Phillifent

Illustrated by John Schoenherr

An alien sun was warm on her face. Shoulder-high grass hedged either side of the rough track that had been machined out of the wilderness. Behind her lay a small cluster of blockhouses, storerooms, laboratories, sleeping units, a conference hall, a dining room, essential equipment for the support of a small human colony. Ahead, at the end of the track, there was a prefabricated shack, and then a gray concrete square, and a ship. Bridget O'Hara knew of these things, but her thoughts were elsewhere, as she strode along.

She knew herself to be an unusual person. She had faced that problem in her teens, had dealt with it, had relegated it to the "so what?" shelf of her tidy mind. Now, at twenty-eight, the shelves themselves were tumbling, and her mind was no longer tidy. For six months, now, she had watched minds as neat as her own dissolve into confusion and dismay before one single concept. Great minds and humble, arrogant or just curious, they had come, by ones and twos, to this fair planet. One by one, they had talked to, and listened to, a voice. And that voice, that gentle but compelling voice, like Poe's raven, had said "Thus far . . . and no farther." The line had been drawn. Humans had reached their limits. Limits? Beyond those . . . impossible!

She had a gift, a happy facility with words, with concepts, and thus, with people. It was her job to sit in on conferences between disciplines, and help to explain one to the other. Those who knew her well had nicknamed her "Catty" because, as someone had once put it, she facilitated understanding, and made things "go," like a catalyst. She had been proud of the name. But how do you explain, convincingly, the idea of hard limits to someone who doesn't want to believe in any such thing? To someone whose whole life is dedicated to the belief that the mind of Man has infinite capacity? How do you explain it to yourself, first? For Bridget had found, very much to her own surprise, that she shared that belief, deep down inside.

She braced her shoulders in irritation at the thought, then paused as a strange sound came to her, a series of noises, from the other side of the high-grass verge. Instantly curious, she parted the grasses carefully and edged forward until she could see.

Two men faced each other, some twelve feet apart, their booted feet silent on the green turf. Slant sunlight exaggerated the play of muscle and sinew on two naked torsos, glared against their white slacks. She watched, appreciatively. They were splendid specimens, and well matched, very much alike, even though one was sunburned blond and the other so chocolate-brown as to be almost black.

In the crook of his arm the black man held a ball, roughly spherical, of well-scuffed soft plastic. By the lift and bulge of his muscles, it was heavy. He rolled it, to and fro, and then, with no warning at all he lunged aside, swinging his arm in a snapping curve, bulleting the ball at his opponent. Bridget blinked at the reflex-speed with which the white man anticipated, leaned away from the

ball, let it swing him round by one arm. Then, adding zest to it, he sent it hurtling back.

"Medicine ball" she identified, to herself. "For exercise. To keep fit. And they certainly do." She stood a while longer, contrasting this gusto with that disillusionment, back there, locating with precision the perfectly natural and primitive influence which threatened to bias her judgment. There were different levels in being human. Comparisons, here, were out of order. She parted the grasses further, stepped through and gave a polite cough. For such a small sound, the result was out of all proportion.

The white man, his hand out to take the ball, beat it down and away, and spun, in one fluid, tigerish movement, to face her, falling naturally into a forward crouch, arms down and out, fingers wide. It wasn't the speed, or the power of it. What struck her like a blow was the sense of "readiness." His hard-planed face, his whole stance, in that split-second, spoke of total and competent readiness . . . for anything!

Then the moment was gone, as fast as it had come, and his hard look gave way to an easy grin.

"Hello. Miss O'Hara, isn't it?"

"I'm sorry to interrupt your game."

"That's all right. Just passing the time. A job?"

"Yes." She recalled her mission, hurriedly. "A ship to meet. She's due in orbit within the hour."

"Right away!" he stooped, caught up the ball, slung it over to thump by the door-step of the shack. The other man had already moved to take up his tunic-shirt and cap, held out similar garments for his colleague. "I'll go warm her up, Holly," he said, and went away round the shack at a trot. Bridget watched this calm man wriggle into his shirt, and hook his cap on his head, and wondered just what would disillusion him? She could read his particulars from the file in her excellent memory. Lieutenant Holborn, Logistics Section, Fourth Squadron, Colonization Service, seconded to special duty, Operation Hagen. That was what the fine print said. In person he looked about thirty, and fit, but couldn't be very bright, to be no more than a lieutenant at that age.

"Something special?" he asked, breaking her train of thought.

"Why do you ask that?"

"Up to now you've been just a face and a voice, over the visor. This time, you've come in person." His voice was dry, with "obvious" underlying it. She stifled quick irritation.

"Yes, it is rather special. I'd like to come along with you. May I?"

"Why not?" He gestured the way his companion had gone, and they began walking. The gray concrete gave back the sun's warmth. Ahead, the ship was an ungainly thing, squatting like an unfinished building project within a ring of its offspring. It was just slightly unbelievable that it could take into itself the helicopter, the two air

sleds, the walking hoist and the massive mobile power generator, and then lift off. It didn't look as if it could lift off at all, but it could. It was designed for performance, not looks. The tail of that thought brought her back to more immediate matters, to the matter of this man, slouching by her side.

She felt the reflected warmth on her legs, knew them to be shapely. She knew, without conceit, that her brief divided skirt and blouse were of a blue to match her eyes, and gave her comeliness an assist it didn't need. She wondered what effect this was having on him, and sneaked a side-glance to see. His steady calm told her nothing. A question trembled on her tongue while she considered. At all cost, they had said—"they" being Dr. de Jong, first, and then all the rest of the savants who had passed this way—the secret must be kept from the military minded. But did they really know what the military minded would think? She determined to find out, cautiously. She flew a trial balloon of a question.

"Do you like being human, lieutenant?"

"There's a choice?"

"I mean . . ." she changed ground, quickly, "do you ever feel limited, or handicapped? Frustrated?"

"All things have limits, by definition," he said. "Limits are useful, so long as you know where they are."

"That's quite a philosophy, for a military man!" she said, shaken just a little by his unexpected answer.

"You're letting the 'Lieutenant' bit throw you. The Colonization arm is in no sense a military force, but a service. And everything has limits. That super-transport, for instance, will pick up and put down again anything under five hundred tons mass, and is good for anything under ten thousand ton-miles. Those are limits."

They came now into the cooler shadow of the big ship, circled to the lower gangway. "I meant it more in abstract terms," she said. "What the mind of Man can conceive, the will of Man can achieve, and there's no such word as impossible. Have you ever heard that saying?"

"Sure. It's one of those big broad statements, strictly for comfort, that falls apart as soon as you look at it." He stood aside to let her step into the hoist, moved in after her, touched a button, and they fell quietly upwards to the control deck in the nose.

"You're quite a philosopher, lieutenant"

"Call me Holly and forget the title. A people-watcher is all. Plenty of material for study, in this job." He stepped out of the hoist, went before her to the close-quarters control room, slid himself sideways into his seat, and touched various switches and buttons. Swinging a microphone to his mouth he asked, "All set down there, Homer?"

"Go when ready, Holly," the reply came, promptly. He pushed the mike away as she slid into the co-pilot seat beside him.

"Homer?" she wondered, and he grinned.

"Homer Aion, the best drive-mechanic in or out of the service. I'm Henry Hill Holborn, bless my over-aspirated

parents, known as Holly. And you have something on your mind, Miss O'Hara."

"Call me Catty, and let's all be friends."

"That's a hell of a name, excuse me." He twisted his head round, frankly surprised, as his hands went out to grasp a pair of well-polished levers.

"I'm a catalyst. I explain people to people. Frankly, I don't agree with you. I think it would be a tragedy if humanity accepted the idea of having limitations."

"Depends how you look at it. Man has wanted to fly for thousands of years, but he can't. Hasn't got what it takes. But he can make a substitute, like this!" He moved the levers, trod on a pedal, and the ship fell skywards, rapidly. She gasped as her weight disappeared for a moment and then came back, bumping her gently into the seat. He flicked a switch and the peripheral viewscreens glowed into life and color. A broad sweep of woodland, hills and distant mountains tilted and fell away, became rapidly distant. The illusion of lifting out of a bowl shifted into movement away from a flat surface. They ripped through cloud for a gray moment, then burst out into the sunshine beyond.

"It's primitive," she murmured. "Unspoiled and beautiful. The Garden of Eden must have been like this." She heard him snort and lean back into his seat, relaxed.

"More limitations. To colonize a planet like this would take a year. One Squadron, which is a miniature mobile city. One thousand hand-picked colonists. A year to transfer facilities from ship to ground, to set up dwelling units, clearings, power-water-food supplies, to deal with local hazards such as predators or insects. A year, with luck. You start with an E-99 per cent planet, your Garden of Eden, but it wants a whole lot of going over before people can live on it."

"You're chopping logic, now."

"Those are limits," he said, flatly. "Dreams are fine, in the head, or in a book, but the real thing is different. Reality is economics. This ship, for instance, could be completely automatic, without me or Homer, but the order of complexity needed would put it right out of reason. And it could still go wrong. It's more realistic, more efficient, to have a pilot and mechanic."

"We are talking different languages," she retorted, secretly amused by his crude attempts to drive her into a logical corner. "I was thinking of visions, ambitions and progress on a broad scale. A century ago, for example, the idea of settling colonists on an Earth-type planet would have been just fantasy. Now it is almost commonplace."

"That's not progress. That's expanding sideways. People have been running off to find new places to live ever since the first bunch of rebel adolescents disagreed with the orders of the old man of the tribe. Running away from a problem that has no solution."

"And what problem is that, pray?"

"How to live together. For thousands of years people have been trying to figure out some way to live in a group and be happy, without tramping on each other's feelings."

If and when we ever do put a colony down there, it will be just the same as always. There will be communal rules and regulations that nobody will like but everybody will try to keep. There will be 'higher' and 'lower,' those who enforce the rules, those who have to accept them; there will be argument, dispute, compromise. Some will gain, others will lose; some will be happy, others won't. Same old pattern."

He broke off to lean forward and make a fine adjustment leaving her in quiet confusion. It should have been simple for her to refute him, but she found that the words wouldn't come. The clean knife-thrust that would expose the fallacy just would not come to hand. Vexed at herself, she realized, with a start, that he had asked her something.

"The signal? Oh! Yes, I have it here." She got out the flimsy sheet, handed it to him, watched him tack it onto his panel with a miniature magnet. All his movements were clean, precise, assured, irritatingly confident.

"Hello RONDIS," he said, into the mike, with one eye on a green tube where flame-edges scissored restlessly. "Hello RONDIS. Transport S-T 28, out of Hagen, to RONDIS. Do you read?"

Even his voice carried that flat quality of utter assurance. For one vertiginous moment she felt like a very small, awed child in the presence of a grown-up. Then she shook herself, rebukingly.

"You . . ." she scolded herself, "have been too long confined to the company of the dedicated and the academic. This breathless, bottomless, destroyed feeling is simply the perfectly natural reaction to the proximity of this male animal. Nothing more. You are seeing profundity where none exists."

She heard him say, "Check me back on those names, would you?"

"Check," the distant voice agreed. "Cadbury Gray, Selwyn Stone, Mark Driver, Stephen Otway. Check?"

"That's what it says here. Right. Expect visual range in about twenty minutes. See you then. Out!" He threw a switch, pushed the mike away, took up the magnet, and handed the flimsy sheet back to her. She saw that he was frowning, and wondered what now? Then he sat back and said, "Those names throw me, completely. Just what kind of a creature have you got down there, anyway?"

All her quick-mix confidence went like the popping of a bubble, and she felt the nauseous twist of complete confusion. Like the gasp of sudden weightlessness, but a thousand times worse, because this was of the mind.

"What did you say . . . a creature? Who told you?"

"Didn't need telling," he shafted a cold side-glance at her, noting her confusion. "You made it obvious."

"You'll have to explain," she said, grasping at straws. The secret was out, but how much of it. What did he really know?"

"All right," he sat back, unruffled. "Two years ago a single-man scout located this planet, reported back. Some-

body in an office looked down a list of six-letter randoms, picked HAGEN, sent a prelim team. They got back, fast. Must have had barely time to land, turn round twice, spit, and scuttle. So they hit something. Then the security wraps went on, tight. So it's something big. Time goes by, wheels turn. Then one Class Three wagon is ordered out, from Fourth Squadron. Include me. Orders are to establish one experimental station, completely automatic, with assorted laboratory facilities and accommodation for eight-ten people. No colonists, but a small group, headed by Segrave de Jong, who happens to be General Secretary of Terran Council for Cultural Relations. Assisted by you, Miss Bridget O'Hara, who makes things happen. So it is a very special something indeed."

He stretched a long arm to touch a control, gently. On a disk immediately before him a green shivering worm grew a hump in the middle of its back.

"A quick job on the station. One small landing strip. One supertransport, with auxiliaries, one pilot, one mechanic, are seconded to special duty. The wagon goes away. I have strict instructions to obey your instructions, and at all other times to stay in my own area and mind my own business. All right, so far? Now, what have you found? Whatever it is, people come, by small groups, to look at it, and they go away worried as hell. The people are not technologists. They are all theory-boys, thinkers and talkers, big ones, double-domes. So there's only one answer which fits. You've found a life form. It's something alive, and with intelligence. Judging by the size of the people who have come to study it, it has quite a *lot* of intelligence."

"You make it sound obvious."

"Thinking always is obvious, afterwards. What is not obvious, now, is these new guests. What are they going to do, scare it to death?"

"You know who they are, then?"

"Sure! Fantasy writers. Reckoned to be the best in the field, for those who like that stuff. I've read 'em. Given a long trip, and nothing to do but listen out for emergencies, a man will read just about anything, even them. Is that the angle? You want these aliens to know *all* about humans, even the psychotic stuff?"

"I suppose that reaction was to be expected," she was stung into sharpness. "You are obviously not impressed by this thing, by the fact that we have, at last, made contact with an alien intelligence, are you?"

"It had to happen sometime. The fantasy boys have been predicting it long enough, in all sorts of ways. Man-kind meets superior intelligence, gets a big boost, a leap forward. Only, by your face, it wasn't like that, at all. What went wrong?"

There was no point in clinging to the idea of secrecy any longer, and it was a relief to put it into open words.

"We've been told we are inferior, a limited species."

"What else did you expect them to tell you?"

"Not 'them'," she answered, dispiritedly. "Just 'it'. The

only one that has so far condescended to deal with us. And only a voice, at that. All the first expedition heard was just a voice, telling them to leave. That, and a convincing demonstration of power to back the order."

"Yet somebody had the nerve to go back."

"That was implicit in the first contact. The understanding was given, that 'it' would be interested to meet more advanced members of our kind."

"That figures," Holborn grinned. "Run along, sonny, and send a man, next time. So we've sent our best, and it is not impressed, eh?"

"That's about the size of it," she admitted, bitterly. "It's friendly enough. It co-operates. For instance, we objected to having bodiless noises introduced into our heads, to having our privacy violated. 'It' insists that it is not telepathic, as we would know it, but has agreed to confine its communications to a single assembly, a gadget we rigged up for the purpose. Just a loud-speaker in a box, not connected to anything. It can handle, to manipulate or negate, any and all forces and energies we can provide for test. It tries to understand us, to come down to our level. As Professor Tarney said, after trying to converse with it for a whole day, 'I feel like a pet dog trying to understand an advanced human chess problem'. And Tarney is one of our greatest living science-philosophers."

"So it's superior, all right," Holborn murmured, and she flared at him.

"You don't understand. A pet dog, no matter how smart, can't learn to play chess. It hasn't got the equipment. An ape may look manlike, but no ape can ever learn to talk, because it hasn't got that something, whatever it is, to make that step. In exactly the same way, the alien keeps telling us we haven't got what it takes to go any farther. We've come to the end of the line. We are a dead end, period!"

A twitch of instruments made him lean forward. "Time I got busy," he said. "You know, a dog would have to be crazy to want to play chess, in the first place, even if it could imagine such a thing. And it's my guess that the four crazy dogs you are importing are not going to impress your alien one bit!"

As she stood watching the inner air-lock cycle open, she already regretted the impulse that had led her to confide in Holborn, and the way in which she had allowed him to irritate her. You don't expect an ape to talk, so you shouldn't expect a muscle-man to understand abstract values, either. The heavy door swung clear, letting the first passenger through, and she went into the familiar routine of greetings, quick mental snapshots, observations and adjustments, leaving the in-depth analysis for later. She already knew enough about these four, from publicity photographs and editorial blurbs, to bridge the first gaps.

Mark Driver was first, a wildly luxuriant hair-and-beard person, thin, barely out of his teens, determined to look mature, squaring tailor-made shoulders. Cadbury Gray, by contrast, was short, thick in the middle, thin on

top, and solidly entrenched behind a smile so fixed that it ached. On his heels, and radiating super-confident *savoir-faire*, came Stephen Otway, arrogant in red-gold quiff and caprine beard. Last, with dignity in all things, was Selwyn Stone, impassive, groomed, businesslike, his only concession to oddity being his dark-framed old-style spectacles. The others moved on, leaving him to speak for the group.

"Miss O'Hara, I believe? I speak for all of us when I say we are grateful for this opportunity to take part in a new experience."

"It was good of you to come, at such short notice," she took his hand, briefly, reflecting that Stone, at least, wore his "personality" convincingly. The dark-framed glasses, with his lean, broad-browed face and shadowed eyes, gave him an air of satanic omniscience. "Along here, and down. It's not very luxurious, you understand, but once we are aground..."

She broke off at the sound of Otway's deliberate drawl, in the distance.

"Ah! Brain of the beast, nerve-center of the metal bird. Not your meat, eh Caddy? Too much technology for you? Ah, but you're agin the idea of *deus ex machina*, ain't you? Not me. This is my nostalgia, all those white-eyed slaves, awaiting orders. I was Space-Navy, once."

"Which half were you?" That was Holborn's voice, like mild steel.

"Half? You missed my groove, sailor. Expound!"

The air-lock door hummed shut at her back, but Bridget heard Holborn's words quite distinctly: "It would take two like you just to pass the physical for one man. What were you, the mouth parts?" She caught her breath, tried to push past without fuss. Otway laughed, a taut snigger.

"A witty oaf, an oafish wit; brass-bound cap on brass-head fit. You know"—she got near enough to see him cock his goatee on one side in a listening pose—"your gyro is just one one-hundred-twenty-eighth of a spin out of synch with your main drive. Can't you hear it?" He extended a slim arm, finger pointing.

"Whoa, boy," Holborn warned, still in that mild-steel voice. "You lay a finger on that panel and I'll break it off clear back to the elbow."

Otway sneered, stabbed his finger forward, and Holborn reached out, lazily, wrapped his big hand round the other's lean one, making it look slow and deliberate. Otway's smile petrified. He came up on his toes, quacking, his free hand beating the air.

"Let go of him, you clown!" Driver started forward, his valiant surge made ludicrous by his shrill treble. "That's his fingering hand. He plays lute!"

Bridget broke clear, darted forward furiously. "Lieutenant Holborn! These people are my guests!"

"And this is my bridge. Get them out!" He let go Otway. Bridget bit down on her rage, swept them with a glance.

"If you gentlemen will make your way down to the next deck, I'll join you in a moment." She watched them go in affronted silence, then swung on Holborn in time to catch him out in a grin.

"Well!" she said, icily. "That was a fine childish exhibition!"

"Wasn't it?" he agreed. "That phony believes his own dreams. He is twenty-five feet closer to the gyro, right now, than he was when he made that stupid crack, and I'll bet my next pay-check he can't hear it, even now. In any case, there isn't any gyro indication on this panel, and it isn't in synch with any main drive, whatever that may mean. So much for Potty Otty!" He reached for his microphone, touched a button.

"Hey, Homer? Better batten down, brother. We have a bunch of flypaper boys aboard. Watch your switches."

"I don't need them the most. O.K. Holly, I'll see maybe I can catch their fingers in the door." Holborn chuckled, shoved the mike away.

"Muscle-bound moron!" Bridget said, distinctly. "When I said 'childish,' I meant you. You with your pathetic faith in what you call reality, snug inside your safe limits."

"You have a kind of glow," he looked at her, approvingly, "when you get mad."

"Painstaking technical accuracy is the last resort of the incompetent and unimaginative—"

"Speaking of limitations," he interrupted, "those word-smiths are a good example, you know. Something like a century and a half ago, dreamers like them, and a few technical people, too, were predicting the death of print, and the word. We were going to have movie-strips, picture tests, portable scanners and viewers, micro-tapes, and all sorts of gadgets. Some were even tried. But, in spite of the hardware, the machine-educators, the trickery, it didn't work out. By the time two whole generations had grown up *really* illiterate, there was a sudden drift back to words, in sentences, in print, on paper, in books. Because the other ways just didn't work. The language got itself streamlined a bit, sure, but that was all. That's a pretty solid kind of limitation, if you like. And you can *read* all about it, in *books*!"

"Thank you for the lecture," she said, frigidly. "Perhaps we can go into your defense-mechanisms some other time? Just now I have guests to attend to." She turned away, but he reached out and caught her arm, gently.

"Don't go away mad, Catty. Stay a minute and see what I call a beautiful sight." He gestured to the viewscreens, where a dark bulk occulted the star field. "That's RONDIS. Doesn't look very big, because she's a mile away and receding fast. On the up-leg, you spoke a piece about a scene, about unspoiled wilderness. Watch this, for the other side of the story."

The dark shape glowed red, suddenly, shaded into hot orange and then faded back to deep red.

"Pauli-generators up to flux. Any moment now—"

This time the color-change was fast; a ripple which

swept into a soundless explosion of rainbow light, up through the spectrum, into blue and then a violet which twisted the eyes, leaving a hole where the ship had been. And then nothing.

"We can't go back to Eden," he said, softly. "Not and stay human. We might not be able to go much further ahead, either, and stay human. But we sure as hell can spread a devil of a long way sideways. Funny thing, too. The Pauli-drive has its effect strictly as the result of a limitation, as if limits are things to use, not to bash your head against."

She was glad to get away from him, down the ladder where her guests were clustered around a single view-screen, wide-eyed. She parried questions and overtures dexterously, almost gladly, anything to shut out the memory of that flat, confident, irritating voice of his. If all men were like him, she thought, humanity would still be crouched in caves, whittling on bigger and better clubs.

Dr. de Jong met them in the small room used for meetings and discussions. A neat, old, careworn man, his shock of hair appreciably whiter now than it had been six months ago, he made a straightforward speech.

"Thank you for coming," he said. "Especially as it was without explanation. I must ask you to bear with me if my explanation, now, falls short of complete clarity."

"Why the mystery?" Stone asked. "Is there danger of some kind? We saw the planetary surface, on the way down. Completely primitive, wild."

"So far as we know, there are no biological hazards, nor any danger of that nature. Yes, a primitive planet. But inhabited. By intelligent aliens. We do not know how many, what they look like, or anything else about them, of our own observation, except that they are . . . interested in us. One alien has made and maintained contact with us, right here. Indeed, it has given us very convincing evidence that it is of a higher order of intelligence than we."

Bridget, sitting to one side, watched the group for reactions. She knew that de Jong had spoken to the alien just once, had steadfastly refused to repeat the experience. That was right at the beginning, but the shadow of it still lay on his face.

"First contact," Cadbury Gray whispered, aside to Otway. "That old theme, come true at last. And primitive, yet superior. Haven't I always said that technics would be our ruin? Haven't I?"

"We're not ruined yet. Back to the Golden Age. But why are we the favored sons?"

"It's a trap, maybe?" Driver whispered, shrilly. Stone lifted his mellifluous voice, for the group.

"Astounding news. And gratifying, in its way. But why us? Surely this is a matter for scientists?"

"The think-boys have bungled it," Otway claimed, in an audible aside. Gray nodded quick agreement.

"They can't measure this with a gauge, so it's beyond them. No souls . . . no poetry. They have to turn to us."

Bridget sagged, inside. She had agreed with this desperate measure, to bring imaginative minds here in an attempt to impress, where everything else of mankind had been dismissed as puerile. But these, after all, were just men. Why had she expected them to be different?

"You won't be asked to do anything," de Jong said. "Just to talk to it."

"Where?" Driver wanted to know. "How? When?"

"All in due course. We will have a meal, and time to let you settle down, freshen up. There's no hurry for the moment."

It was a miserable meal, strung on wire-taut nerves, full of jerky conversations which sprang from nowhere and went back to the same place. It was a familiar pattern, to Bridget. She had seen it happen each time a group sat in wait for the big moment. Eventually she led them into the tiny room, once intended as a projection theater for observation films, and introduced them to the innocuous black box which sat enigmatically on a table there.

"It will speak to you individually and alone," she explained. "You signal readiness by switching this light on. That's all the switch does. It's no more than an agreed signal between us and the alien."

"Why doesn't it show itself?" Driver demanded, belligerently. "Come out in the open, honestly, eh?"

"What would happen if I switched it on now?" Otway put his finger out, ready. Bridget eyed him. This was a slight change in the pattern.

"I've no idea," she admitted. Otway carried the movement through, and the pigmy-light glowed.

"**ICONOCLAST.**" The word was distinct, yet non-human, in some way that Bridget had never been able to define, even after many hearings. "**IT MEANS ONE WHO DELIBERATELY BREAKS PATTERNS, DOES IT NOT, CATTY?**"

"Not quite," she replied, steadily, as the four went back three smart paces and huddled. "Images . . . would be closer."

She had done this often, but it was still eerie. A bodiless voice, trying patiently to understand the meaning behind the meaning, the personality under the word.

"Is it reading our minds?" Gray asked, his set smile stiffening. "Is it telepathy?"

"Junk!" Otway denied. "Nobody can read minds!"

"**AGREED. MIND IS REACTION-RELATIONSHIP. THE TRANSLATION INTO WORDS IS UNIQUELY INDIVIDUAL AND EVANESCENT.**"

"This is a gag of some kind, a jest." Stone lost a little of his smoothness. "Isn't it?"

"Of course it is," Driver squeaked. "There's got to be something queer about a thing that has to hide itself behind a box." Bridget remembered that this was the author of "Broadsword and Star," "Blades Across the Galaxy" and similar extravaganzas, and made allowances as he went on, "Why doesn't it come out in the open and show itself, eh?"





"AGREED," the box said, evenly. "I WILL SHOW MYSELF. I WILL MEET THESE FOUR, IN PERSON. BRING THEM TO ME, CATTY."

"Where?" she asked, astonished.

"IN YOUR TERMS . . . TOMORROW. EARLY. YOU WILL BE GUIDED." The voice stopped, and the pigmy-light shut itself off with a distinct click of the switch.

That, she thought, later, was the most disconcerting bit of all, that switch going over by itself. It had shattered the four. It had convinced them, too. Later that night, sitting on the edge of the bed in her own room, she wondered. Was it legitimate to derive supernormal understanding from such a simple thing, or had it been sheer chance? Whichever it was, it had worked. She shrugged, reached into a drawer for a well-worn "macelsee" notebook, and pencil, and began deriving McL-C profiles for the four newcomers.

The McLandress Coefficient had originally been "value-free." Devised by a Professor of Psychiatric Measurement. in the latter part of the Twentieth Century, it claimed to measure a new "dimension," the relation between a person and "self," and expressed as a figure the length of time the individual could maintain his focus of interest on something other than his own personality. Sharpened and refined over the years, it had found many uses, not all of them approved. Opinion-molders and social scientists waged war on each other's use of it. Diplomats of all textures found it a quick and reliable way of striking a rapport with short-term acquaintances. With it, for instance, one avoided the futility of trying to discuss broad generalities with a person in the sixty-second-or-under range, or the equally hopeless task of seeking deeply-felt personal emotions from a five-hour eccentric. For relationships of all kinds, the McL-C revised ratings were invaluable.

Bridget specialized in relationships, and had conscientiously kept McL-C tabs on everyone she had ever had to deal with. Now, using the near-perfect playback mechanism in her head, she proceeded to measure Stone, and then Otway, Cadbury Gray, and Driver. The results were in no way surprising, ranging from fifteen seconds for Otway, to fifty-eight seconds for Stone. She went over them a second time, correcting for estimated age, to derive a counter-value, an addition since McLandress, generally known as "self-security index." Here again there were no shocks. Out of the full range from zero to unity, Driver scored .18. Otway did better, with .24. Gray beat him with .29, and Stone had a mature .36.

Reasonably satisfied with himself, she mused, shutting the book to spend a moment in wondering whether this routine of hers was worth anything, any more. After so many years of doing it, she could make a snap estimate and be right enough, without going through all the tedious calculations and refinements. Then a wry thought came, out of nowhere. What about Holborn? She hadn't classed him as "business" in that sense—but why not?

Opening to a fresh page, she switched on her memory and began. She was so divorced from the actual operation, so as not to bias her recall, that it wasn't until she came to knit the whole thing into a figure that she saw where the figure must fall. And she didn't believe it. Frowning, she did it all over again. Same answer. McL-C . . . infinite! To put it less impossibly, Holborn's preoccupation with "self" was zero!

Insufficient data, she told herself, resolutely. Nobody could be *that* impersonal. She went back to the beginning and painstakingly derived the counter-figure. And swore an unladylike oath. Self-security index . . . unity! So much for psychiatric measurement, she told herself. She had heard learned men describe the McL-C coefficient as a measure of "maturity"—and others who scornfully dismissed any such idea as piffle. Then, even as she tossed the book aside, her memory served her up a voice to make her cheeks burn, the dry, caustic voice of her instructor of many years ago.

"Any technique which claims to measure human potential will meet with fanatic opposition. The reasonable thing to do is use it, check it with findings and observations, and if it works, accept it."

So it works, she argued. What does that prove, except that Lieutenant Holborn is a completely self-satisfied, conceited nobody? She was still saying it to herself as she went to sleep.

Holborn put the helicopter down on the silver beach with hardly a jar, just ten yards up from the surf. The jungle began, dark and green, five yards farther on. Bridget climbed out, moved away to watch the four follow her. The voice had given her map-references, and instructions to wear a bone-conduction speaker behind her ear. The four had been outfitted from stores with tropical shirts, shorts and half-boots, and even allowing for the garb, their appearance was not reassuring. She thought she had never seen four less likely people to be the saviors of mankind's ego. Holborn, and Homer Adion, satisfied with the security of the helicopter, moved up the beach to join the crowd, and she eyed them with disfavor, too. Both looked neat, competent and at home. Each had a laser-beamer slung over a shoulder, and a broad belt loaded with businesslike looking gadgetry.

"LOOK FOR A GAP BETWEEN TWO TREES. BEGIN THERE. FOLLOW THE TRAIL." The voice was as urbanely impersonal as ever. Bridget swung until she could see the indicated trees, lifted her arm to point.

"That's our way," she said, and began trudging up the sandy slope.

"Hold it," Holborn ordered, firmly. "You don't just barge into jungle that way. I'll go ahead. You follow me, and guide. Then these four, and Homer will cover the rear."

"There's no need for that," she said, coldly. "This isn't an expedition into danger. The precautions and the weapons are quite unnecessary."

"You're the boss," he agreed, instantly. "Homer and I will just wait here, then, 'till you get back." But she didn't want that, either. She wanted him to be confronted, to be shattered, just like any other man. But she had learned better than to argue with him.

"Very well," she shrugged. "We'll do it your way."

"What about us?" Otway demanded, as they reached the high-grass fringe. "Don't we get weapons?"

"Not behind my back, you don't," Holborn told him. "You can always shoot off your mouth, though," and he pressed ahead, into the gloom.

It was a natural tunnel, the trees overhead in-leaning to form a great arch, dimming the sunlight to a cool green glow. Rich scents hung in the humid air and the sounds of their movements lost themselves in the quiet all round. But not absolute quiet, she thought. Just audible, there was the sleepy hum of life, in the middle distance. Holborn, four paces ahead of her, had taken on that air of instant readiness she had seen on their first meeting. Total self-confidence. She thought of a spiky saying she had once heard: "If you can keep your head whilst all around are losing theirs, maybe you haven't grasped the true facts of the event." Stifling a smile, she looked back at Driver, close on her heels. Shorn of his shoulders he looked more youthful than ever.

"WHY SEVEN?" the voice asked, but before she could think of answering, she froze in unbelief as Driver sank, down to his waist before his lungs could pump one bloodcurdling scream from his mouth. Then, while it was still raising echoes, she saw him go right down, to his chin. A swamp hole, there? But it couldn't be. She had just walked over that part. She was brushed aside as Holborn went past her like a thunderbolt, skidding to a halt on the edge of the slime.

"Come on!" he shouted, to Otway, who stood beyond. "See how close you can come. Quick!" Otway shuffled, nervously, testing his steps. A squish under his feet showed the treacherous section to be about four feet wide. She saw Adion, coming up at a gallop, and Holborn signaling him. Driver was gone—just two slimy hands clawing up from the brown ooze. Holborn stiffened, fell forward on to his hands.

"Climb on me, Homer," he snapped. "Quick, before he goes too far down." Adion half-threw, half-wriggled himself on to the living bridge and craned over, reaching down into the bubbling mess. Bridget held her breath as she saw the strain go on, and the slime sucking, unwilling to yield up its prey. Then Driver's head was clear, spouting mud, and other hands reached, to help with the load. Seconds later he was stretched out on the green, solid ground, to retch and groan while the others stood and watched Holborn make a quick check.

"He'll be all right. Wasn't in there long enough to drink much of it," Holborn rocked back on his heels, wiped his hands on the turf and stood up. "Shock is the worst part, especially him."

"Why do you say that?"

"You've read his stuff, surely?" Holborn gave her a hard look. "You know his favorite horror theme is to box somebody up in a dark, slimy space. He's claustrophobic."

Five minutes later the column was moving again. Bridget put two and two together in her mind, and did not like the answer. There had been no bog under *her* feet, and it was altogether too good a coincidence that it should trap the very person most likely to be shocked into a walking coma by it. Then, breaking her meditations, making her jerk round nervously, came a sudden yelp and flurry at her back. It was Stone, coming up from the rear at pell-mell speed. Stone the impeccable, the portentous, now gibbering with fear, the sweat popping out on his lean face.

"Spiders!" he mouthed. "Spiders . . . millions of them . . . everywhere, all over the place!" Again she felt Holborn brush her aside, but this time she ran after him, angrily, to where Homer, with leveled beamer, was wreaking deadly havoc among the many-legged horrors which blanketed the trail and fell from the overhanging trees in a steady rain. Stone had not exaggerated. There were swarms of the things. She knew something of beamers, that with one you just sighted, and what you saw, you hit, but she had never dreamed that one could be used with such speed and accuracy as this. The beady-eyed bundles of fur-on-legs burped into fireballs one after the other with the sound of a man trotting in slippers. Then, as Holborn shook his beamer into his arms, the beat was doubled, and the stink of scorched bodies began to drift back.

Holborn said, without missing one beat, "I never saw spiders like these before, Homer."

"How's that, Holly?"

"They breathe. Hear 'em?" Bridget could hear them, too. They twittered. But that information didn't seem nearly as important as the undoubted fact that they were coming faster than they were being killed.

"This is no good. Like bailing out the sea with a spoon. Keep 'em going a bit, I've got a better idea." Holborn slung his beamer, and felt in his belt for a stumpy cylinder with a brass cap. Over his shoulder he shouted a warning. "Back up. Get well clear. Take a good deep breath and hold it. You ready, Homer? Here she comes!" and he cracked the cap, held the tube at arm's length, pointing towards the rustling horde. She saw a thin yellow jet of liquid spurt, and disperse almost at once into heavy vapor. She saw the front wall of spiders rear up and scramble back over their fellows. As the vapor spread, she saw them scuttering frantically away before it. She saw Holborn stoop, and jam the cylinder in the earth, tilting forward. Then she turned and ran, with the two men hot on her heels.

"What was that, Holly?" she panted, as they rejoined the rest, and turned to watch.

"Retch gas. Standard equipment for clearing pests

from awkward places. Breathing spiders are new on me, though. Funny that Stone should be picked, too, as he's so scared of them."

"Phobia," Stone gulped, and looked sick. "Can't abide them. Sorry!"

"It's not your fault," Bridget snapped. "This is deliberate!" She spoke loudly, convinced that she was heard by the alien presence.

"AN INTERESTING AND REVEALING EXPERIMENT," the voice said, in her ear.

"You mean your friend is playing with us? Could be. What's next, round the bend? What's your pet nightmare, Gray?"

Before Cadbury Gray could answer, the ground began to shake under them to the tread of mighty feet, and they rounded the bend to find the next fifty feet of tunnel filled with the lumbering form of a great horned beast.

"Oh, no!" Bridget gasped, in sheer unbelief.

"Oh, yes!" Holborn corrected, grimly. "A genuine fire-breathing dragon, no less. How infantile can a man get?" There was no need to ask whose horror this was. Cadbury Gray was down on his knees in the turf, his pudgy face a grinning mask of terror, hands quivering out to push the fear away.

"Be careful, Holly!" Bridget caught at his arm. "Nightmare or not, that thing is real. I can feel the scorch of those flames to here. It's not an illusion."

"Neither am I," he growled. "Your alien seems to have under-estimated us humans a bit. Been studying the wrong ones, I reckon. Listen, all of you. When you hear me holler, go down flat and stay that way until I tell you to move!" Then he was off, at a trot, straight between the twin spouts of smoke and fire from those flaring nostrils.

"SEVEN," the voice remarked, in her ear, "AND TWO ARE NOT AFRAID. WHY HAVE I NOT MET THESE BEFORE?"

"Why are you treating us like this?" she muttered, fiercely. "We thought you were friendly!" She caught a fragmentary glimpse of Holborn, as he dodged through the smoke. The great beast opened its maw, throwing its upper jaw and horns well back. He dug his heels in to stop, lobbed something glittering into that yawning gullet, and swerved aside. Then he yelled, and went down on his face. Bridget dropped, too.

"NO LASTING HARM HAS BEEN—" the voice cut off, abruptly, in her ear, as the air was rent by a great blurping explosion, followed by a gushing hot stench. She raised her head, cautiously, peering over her arm. Where the dragon had been there was a sick-making heap of bloody meat, and twitching limbs. And Holborn, getting to his feet and dabbing at the mud and blood on his clothes.

"More standard equipment?" she asked, weakly, and he chuckled.

"Right. The regular *modus operandi* with that baby is to drive a posthole, drop one in, follow it with a tamping

plug, and get clear. Fragmentation bomb. Quick way of loosening up hard ground for cultivation. The colonist's friend. Gave your dragon a bellyache, I reckon."

"I could almost wish you had killed whatever it is . . . behind all this."

"OH, NO," the voice was as urbane as ever. "I LEARN BY EXPLORING INDIVIDUAL REACTIONS TO STRESS. NO HARM DONE. ONE MORE TEST REMAINS."

"Oh, oh!" Holborn touched her arm. "Get this. Special delivery for Otty, or I miss my guess."

She was tall, slim as a willow, and literally radiant. Her golden hair was an aureole around her perfect face, and tiny feet spurned the turf as she glided forward. In between was gauzy gossamer, hinting at impossible perfections. Bridget knew a moment of scalding sea-green envy, and then Otway went past her, wide-eyed and overcome.

At his babbling incoherence the vision smiled, radiantly, tenderly . . . and then opened her mouth . . . and where there should have been a tongue, a flat scaly snake-head reared, thrust out, blinked yellow eyes, and spat. Otway screamed once, spun around and went down like a dead man.

"That's enough for me," Holborn growled, and shook his beamer into his arms, leveling it. The gorgeous vision put up a hand to delay him. All at once the pearly radiance faded and Bridget saw an ordinary, if very shapely, woman. Blue eyes stared at her, calculatingly, then as if by afterthought, the shape was draped in a simple cloak.

"Better?" "she" asked. "Yes? Good. I think we can talk, now. This shape will be suitable."

"More tricks?" Holborn was not convinced.

"No. My tests are complete. You are Holly? This dark one is Homer? Interesting. Come!"

"Hold it!" Holborn was still not satisfied. "What about this bunch?"

"They will be safe, here. Our talk is not for their ears."

Bridget shook herself, wondering if she had, somehow, slipped over that nebulous border between sanity and the dreamworld of madness. The dragon-meat was gone, completely. Otway had stirred, sat up now, into a stupefied squat. The other three came to sit by him. Stone, Gray . . . and Driver, clean and free of the slime which had smothered him a moment earlier.

"No, not illusion," the vision answered the unspoken query. "This is manipulation. I rule, here. Come and be comfortable." "She" led them on along the path, to a low bank, by the dark mouth of a cave, at the foot of a great rock wall.

"A glade," "she" said, studying the effect as if seeing it for the first time. "You humans make pleasant pictures, at times." "She" settled herself, indicating them to sit around her. "This form is pleasing, too. And instructive. It explains much."

"We can do with some explanations, too," Bridget de-

clared. "Just what is the purpose of this masquerade, and that parade of horrors?"

"I seek to understand your thinking patterns. What you would call 'living' matter, I would call a 'self-organized system'. Such a system has pattern and form. The process of preserving that form is 'thinking', resulting in action. To understand your thinking patterns properly, I have assumed your form, with all its limitations. Much is clear to me now that was obscure before. This form of communication, for instance, imposes barriers. I may not be able to overcome them. I will try."

"So you have limits, too?" Holborn suggested, and "she" smiled at him, mischievously.

"This form has limits. Structural limits."

"But all that performance, all those monsters!" Bridget was still indignant. "Was it necessary?"

"To test one or two hypotheses, yes. You told me these four were great in imagination. You set great store by this faculty of imagination. It was obscure to me. For me, 'imaging' is prior to doing and being. Now, in this form, I realize that your 'imaging' is multi-dimensional, like mine, but your thinking, so far as you can communicate it, is linear. This means that by far the greater part of your awareness can never be communicated. This fosters illusion, because the inner world becomes greater and more real-seeming than the external. For those who value their private world more than the real one, there is only retreat. You saw what happened when I matched external reality with internal. Illusions are safe, because they can be suppressed. But made real, out there, they threaten. Your private thought patterns, simply because you cannot communicate them, become fearful-wonderful-precious."

"But we *do* communicate them," she argued. "Writers especially. And my whole function is to communicate, to explain. *You* are communicating, now!"

"This method is linear, is limited, is sounds, words and sentences in strict sequence. Thinking is multi-dimensional patterned, and cannot possibly be fully conveyed by linear methods. What emerges in words is but a fraction."

"I'll go along with that," Homer said, unexpectedly. "You can diagram a circuit, and it helps, but you have to handle the real thing, to understand it. A high-flux generator is more than just wire, plates, nuts and bolts, and power flow. It's an arrangement." He hesitated, groping for words. "Like a net is an arrangement, but if you took it apart it would just be lengths of cord, one after the other."

The alien nodded, approvingly. "You are a new experience to me. Your kind has a long history of communication by sign, gesture and movement. By dance. Speech loses all that."

"Ah, but wait," Bridget objected. "We do have pattern communication. We have visual arts. And music."

"Yes. But always you come back to 'explaining', in words."

"Are you trying to say we've talked ourselves into a corner?" Holborn asked. "Because our wise men, particularly our biologists, have claimed it was our ability to talk, to make abstractions and speech-symbols, which gave us the edge on the rest of the animal world. That, and the ability to make and use tools."

"Speech, also, is a tool. Your form has specialized in tool-using, and your biologists know what happens to a form which specializes too much. Tool-using gave you an advantage, to begin with, and eliminated all other competition in the process. Tool-making still serves you well, to extend your abilities and powers on a material level. But your thinking is trapped, bottled up by this overdevelopment here"—"she" tapped her forehead—"which insists that it must all be funneled through a logical outlet, in speech and words. The result is that each one of you is inexorably alone, and individual. Even though each one of you is involved with, and a part of, life-as-a-whole, and may even 'feel' that . . . he can never 'know' it for sure, in your terms. Still less can he communicate it to anyone else."

"That rings a bell," Holborn nodded. Watching him, Bridget thought she had never seen anyone so completely at ease in such unlikely conditions. "I've read various accounts of mystics. They all have a common pattern. By some discipline or other, sometimes by sheer accident, a man catches a glimpse of the whole span and plan of things. Just for a moment. A timeless moment, so many of them claim. He knows, or thinks he knows, all things. Then he comes back to dull reality, only to find that he can't tell anybody else, because it just won't go into words that make sense."

"Exactly. This design-for-speech is a trap, a dead end. You can no more break through it than you can produce a cube on a plane surface . . ."

"She" stopped, abruptly, and then nodded. Her smile for Holborn became a caress. "I see, by your reaction, that three-dimensional effects *are* produced on plane surfaces. I like your thinking. Holly. It is free of knots."

Now, for the first time, Bridget saw the big man squirm and look uneasy, almost worried.

"I thought you denied telepathic powers?"

"I do. That concept is invalid. Only a being preoccupied with word values could evolve such a belief. I am aware of, and I do know, in the sense of being able to apprehend, what you are thinking. I cannot explain how in this form of communication, but let me try to explain what the result is, as that explanation may serve another purpose. I 'know' what you are thinking, *all* that you are thinking, at any given moment. Now," "she" paused for emphasis, "that is considerably more than you yourself know. You use the terms 'conscious' and 'unconscious' to demarcate thinking processes. What they indicate, quite simply, is this. The 'conscious' is that small fraction of your total-thinking which you can snare and convert into a picture, and then into a word-symbol. That is an extract, and then a two-step conversion."

"But that's elementary semantics," Bridget protested. "The word is not the thing, we know that." "She" caught the point, instantly.

"Of course. And the conscious, the tiny part which you catch and strangle into a line of word-noises, is not the thinking. It is only a symbolic representation of a part. I cannot read the words in your mind because there are none there. But, because I do know the whole of your thinking, I am aware of the shackles this word-making sets upon your efforts to think. And, inevitably, on your power to go any further with that process. You are specialized for word-making, and that's the end of it." "She" shook her head, saddened for a moment. Then "she" brightened again, turned to Holborn.

"Those other images, now. The three-dimensional effect in a plane . . . an *effect*. Illusion, a glimpse of something greater. But the real thing can never be achieved, in two dimensions. So, also, with your fish, which does not really fly. It manages, for a brief while, to break the surface and glide . . . to get a glimpse of the world of flight, for one glorious moment . . . but then it must, inevitably, drop back into the water. It must go back to being just a fish. Such is its design. So also is yours."

"I don't agree!" Bridget's tone was sharpened as much by the look on the alien's face as by the argument. Superior intelligence or not, she was wearing a female form, and Holborn was undoubtedly male . . . a situation fraught with dangers, whichever way you looked at it. "That is not necessarily a valid argument. Fishes have left the water, before now. Our remote ancestors did, or we wouldn't be here. What's been done once can be done again."

"Not by you. Fishes leave the water, but not as fishes. They must have the potential to change. You have lost that potential. There is your stop, your limit . . . that word you do not like. As humans, you cannot make the next step, which is co-operative intelligence. You have three interlocking barriers, all specializations. Your limited, linear speech, which constricts your thinking and makes you 'human'. Your shape, which is rigid and particular, and is part of being 'human'. And the product of these, which reacts with them . . . your 'individuality', which makes you 'human'. Like the flying fish, you may glimpse, for a moment, something more, but you will have to fall back, each time. There is no escape, for you."

"That problem doesn't seem to affect you," Holborn said. "How did you beat it?"

"By being complete in myself," "she" said, and her smile was still on Holborn. "Until I met you, I had not thought that a human could be similarly self-complete, completely realized within the form. Are you unique?" She spared a glance for Homer and added, "This one is almost the same. Given a machine to share with, he is complete. But you"—"she" returned to dazzle Holborn—"are whole!"

"Nothing special about me," he disclaimed, hurriedly.

"I'm pretty ordinary. I'm curious about you, though. Can you leave this planet?"

"Why should I? I *am* the planet. All of it, or any part of it, just as I choose. I am a whole, complete, just like you. Why should I try to run away from myself?"

"That's an answer, of a kind," he agreed, and got to his feet. All at once Bridget sensed that this was a crisis, and realized the tremendous danger of their position. "I think," he said, evenly, "that it's time we left. You won't want us hanging about on your planet any longer, will you?"

"I would like you to stay," "she" said, meaningly. "I would make your stay a pleasant one . . ."

Bridget, on her feet in a hurry, caught her breath as crackling tension built up in the quiet glade.

Holborn stood quite still. "Of course," he said. "If there's anything I can do to help, I'll be glad to stay."

A chill breeze drifted through the glade and the distant sunshine faded. There was a faint murmur of thunder.

"I understand," "she" said, quietly. "You are very astute, Holly. Very well, you may leave. Please go quickly!"

"I was never so terrified in my life," Bridget gasped, as they broke out of the trees on to the beach, herding the dazed group of writers before them. "She had us in the palm of her hand."

"Still has," he pointed out. "Let's hope she's not too much like other females, and given to changing her mind."

"Female, of course." Bridget watched Homer helping Stone and the others into the helicopter, and shivered as a breeze twitched sand against her legs. "That's logical, even for a whole-planet entity. You realize she wanted you to fall in love with her, don't you?"

"That was just the shape affecting her. I've done some fool things in my time, but I'm not about to fall in love with a whole damn planet!"

"Maybe, but a whole damn planet almost fell in love with you! She could have *made* you stay."

"As what? An equal, or a slave. There's her choice, and I'll bet she will have a laugh, when she thinks of it." As if in response to his words, the breeze died and the sun blazed out from behind clouds. "I could never be her equal, that's obvious. She's self-sufficient. That's why I spoke my bit about helping. You can't help a self-sufficient person. Such a person has no use for a slave, either. I should know. I'm an individual, too."

"You're a strange man, Holly. I shall never understand you. That's part of what she said. Do you think she was right, about us humans?"

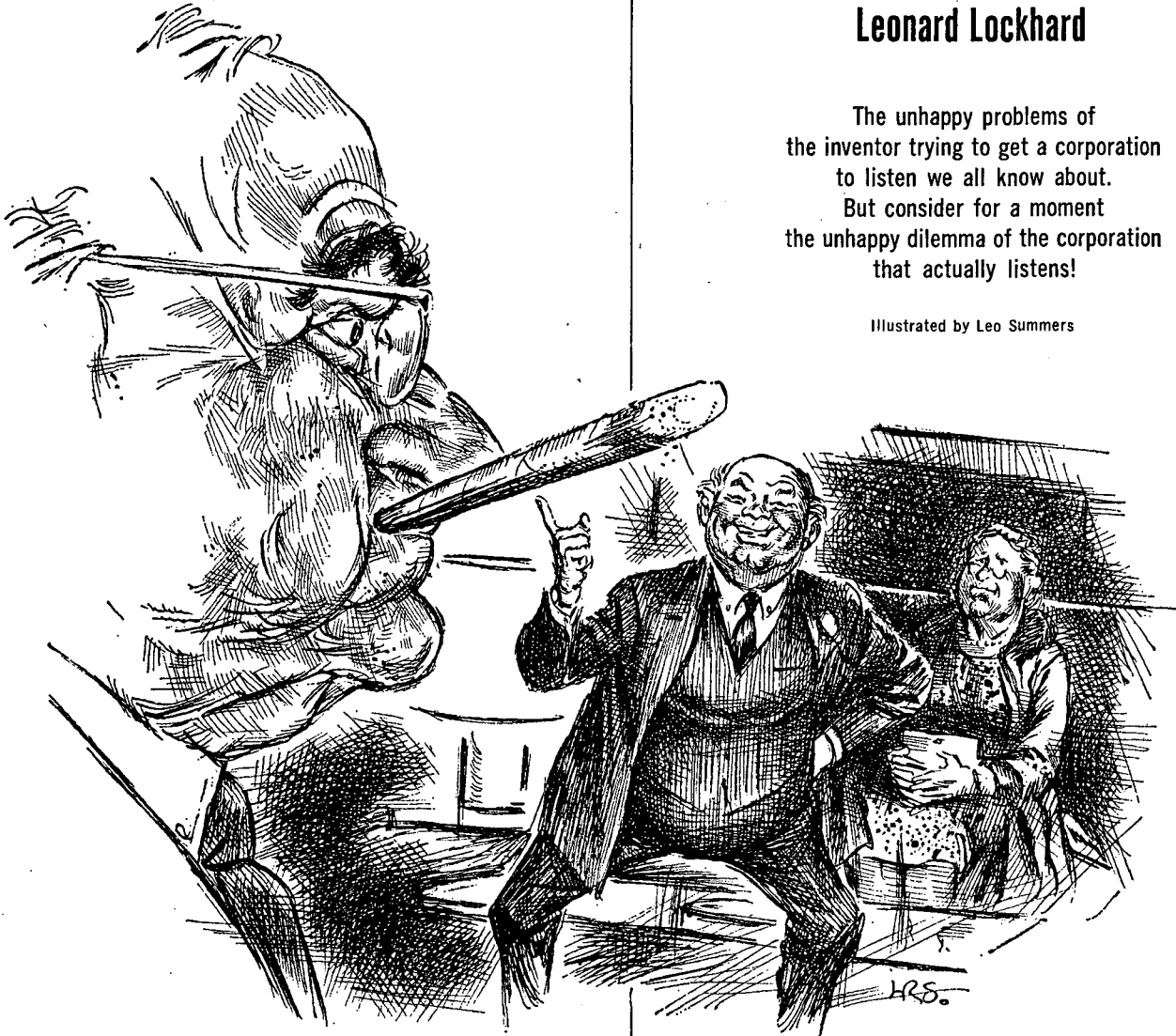
"Talking ourselves into a corner, you mean? Could be, but we usually manage to talk our way out again, you'll notice. The bit I liked was that she can't leave this planet. That's her corner, and she's stuck with it. For all our limitations, we have all the rest. All that . . ." and he gestured to the sky. "That's a whole lot of water to swim in!" ■

Professional Dilemma

Leonard Lockhard

The unhappy problems of
the inventor trying to get a corporation
to listen we all know about.
But consider for a moment
the unhappy dilemma of the corporation
that actually listens!

Illustrated by Leo Summers



It was the morning mail that did it. Susan opened it and put it on my desk, and I found that I had from the Patent Office three Notices of Allowance, a reversal of the Examiner by the Board of Appeals, and a winning decision in an Interference in which I represented the junior party. It was quite a morning's mail. I thought it over for a few seconds and walked out to Susan's desk in the outer office. I said, "Susan, will you marry me?"

She looked up at me with what seemed a relieved expression, almost as if she had been expecting me to ask her to marry. But that was impossible since I had only thought of it myself a few moments before. I said

to her, "I'm going to ask Mr. Spardleton to make me a partner around here. I've been with him for ten years now, and things have been going well, I have been working without much supervision negotiating licenses for our clients, and carrying Interferences all the way through, and reissuing patents, and getting some sticky cases allowed, and even a junior partner would be nice so why . . . ?" She held up her hand, and I stopped talking. I must have been running on there.

She said, "Carl Saddle, of course I . . ."

"Harrumph!" It was a throat-clearing rumble from Mr. Spardleton's office, the window rattling one that meant he did not like the way something was starting out. I could visualize him in there, reading a letter or Office Action, his cigar beginning to rise up to the Fighting Angle.

I said, "I'll talk to him right now so we will know our future . . ."

"Oh no!" Mr. Spardleton's voice was quite clear.

I said, "You haven't given me your answer, Susan. Will you . . . ?"

"Those idiots!" Mr. Spardleton was in full voice now; you could feel his words.

"I'll go in and see if he'll agree to make me a partner starting the first of the month. I'll be right back." And I started for the door.

"Carl Saddle, come right back here." Susan's voice was commanding, I must say. In ten years I had learned that when Susan talks like that it is well for all present to heed what she says. I came right back there, and asked her what was wrong.

"Are you seriously considering going in now and asking him to make you a partner when he's in a mood like that?" She pointed at Mr. Spardleton's door. There were strange gulping noises coming out of it, and the sound of heavy breathing. I realized that Mr. Spardleton was not in the right frame of mind to distribute largess or dispense bounty. I nodded at Susan glumly, and headed back toward my office. I never made it.

"SADDLE." It was the summons to duty, and I skipped right through Mr. Spardleton's door and up to his desk.

"Yes, sir," I said.

"You've been handling most of the work for the National Chemical Company, haven't you?"

"Yes, all the overflow work their department couldn't do, and I've acted as outside counsel on some of their close questions, too."

Mr. Spardleton's cigar was in an almost vertical position, and the puffs of smoke shot straight out across his office. He said, "With an entire staff of competent patent lawyers, plus half a dozen general lawyers to look after them, will you tell me how it is possible for some matron in Buxton, North Carolina, to write a letter that gets read by half a dozen research people and kicks around the company for six months before the lawyers find out about it?"

I didn't know what he was talking about. I said, "What's wrong with a letter? They're supposed to be read." I thought I would josh him out of his bad humor.

He looked at me, and I was sorry I'd said it. He said, "This was a suggestion that the company make a new product and sell it all over the country to housewives who were just dying to get such a product."

That did not seem so bad to me, but I began to be a little cautious; Mr. Spardleton did not get upset over nothing. I said, "Was it a good idea?"

"It was a pip, so good the company had decided to put out the product before the letter arrived. But they never bounced the letter before some of their research men read it. They didn't even write to tell her that they would not let a knowledgeable person in the company read it unless she agreed to their usual conditions; they never prevented a confidential relationship from cropping up. Oh no: Instead, some idiot in the company got the letter, opened it, read it, and circulated it to the people he thought would be interested. Months later it finally got to somebody who recognized that company policy was being violated. He let the lawyers know, and here we are with a hot potato."

"Why don't they just pay her," I said. "Give her a thousand dollars, or something."

"Well, they want us to take it from here. Let's find out some more details before we decide anything."

I thought a moment, and said, "Don't I remember a case where a housewife sued a large company for one million dollars, a few years ago?"

Mr. Spardleton looked at me approvingly. "That's right. Keep thinking, Carl."

I kept thinking, and I began to see a glimmering of light. I said, "The Blue Cheer Case, wasn't that it?"

"Very good, *Galanis v. Procter & Gamble*, filed in 1958. Do you remember the facts?"

"Hm-m-m. Mrs. Galanis wrote a letter to the president of Procter & Gamble. She offered to sell him a new idea for a new kind of laundry soap. She told him to put the bluing right in with the detergent so that the housewife did not have to mix up the bluing with water and then add it separately. She told him she had been putting the solid bluing with the detergent right along, and that all the neighbors loved it. Wasn't that about it?"

"Pretty good," said Mr. Spardleton. "She also suggested the name; she told him he ought to call it 'Cheer'. Go on."

"Well, somebody at the company wrote back and said that her idea had already been suggested, and rejected. Furthermore, they intended to try a different approach at the company using fluorescent dyes in the soap. So that ended the matter for a while."

I squinted up at the ceiling, and went on. "A couple of years later, out came Blue Cheer, a new product of P & G, which seemed to match exactly the thing Mrs. Galanis had described. She got herself a lawyer, and that's how

the case of *Galanis v. Procter & Gamble* came into being, for one million dollars."

"What result?"

"Well, as I recall, the case was dismissed with prejudice before the trial, so it never went anywhere."

"They were lucky. This may be the most contradictory field of law there is. A lawyer from Philadelphia wrote an article on the subject, and one of his sentences was, 'There appears to be much bad law, or at least direct conflict of law—so some of it must be bad.'"

I said, "I vaguely remember reading an article called *Pity the Poor Corporation*, by Theodore L. Thomas. I got the idea from it that the law was not at all clear."

"Yes, brilliant legal mind, that man. Look here. If X copies a chapter out of a technical book and submits it as an idea to Y Corporation, and Y adopts it, some courts will allow X to recover from Y under some conditions, even if Y had the technical book in its own library. Is it any wonder that corporations are reluctant to accept or even read any ideas from outsiders?"

I nodded, and he went on. "In the case of *Pressed Steel Car Company v. Standard Steel Car Company*, the defendant could not use drawings of a freight car it got from the plaintiff, even though the freight car itself was in wide use. Yet the Restatement of Torts says, 'Matters which are completely disclosed by the goods which one markets cannot be his secret.' Well, I don't like the way this one is starting out. The company's counsel seems to think we may have a problem here, and you know the way an old lawyer can smell trouble before it breaks."

I knew very well. I was looking at an old lawyer who smelled trouble. In fact as I looked at Mr. Spardleton, I suddenly knew with absolute certainty that here was a case that would be a pip.

He said, "Get tickets on the next airplane for Wilmington. We'll get right on it."

Four hours later we caught a cab to the general offices of the National Chemical Company. We went right to the offices of the executive vice president. We walked in and Mr. Spardleton said, "You are looking a little drawn, Jim. You still think it's worth it?"

James Shannon, the executive vice president, grinned at him and said, "Helix, you never looked better, and yes, I still think it's worth it. Care to compare net worth?"

"I'll be glad to, if you'll throw in health, the right to decide things as you see them every time, and enjoyment. That's part of net worth."

Shannon said, "Nope, just money and property. I don't like a fight as much as you do. Besides, I'm willing to spend a little health on a few thousand shares of Christiana, Limited. You're not. So we're right where we were forty years ago."

I knew all about this talk. Mr. Spardleton and Mr. Shannon had been in college together, and each had gone his separate way, each trying to argue the other into coming over to his side. The argument still raged.

Mr. Spardleton said, "Jim, you remember Carl Saddle."

"Certainly. How are you Carl?"

"Fine, thank you, sir."

We all sat down off to one side from the huge desk while Mr. Spardleton and Mr. Shannon exchanged some more pleasantries. Then Mr. Spardleton said, "What's happened around here, Jim. You don't usually call me in unless something disastrous has happened."

"I don't really understand it myself, Helix. The lawyers are all excited, but I don't see anything to get excited about. This woman sends us a letter making some suggestions. We don't want the suggestions, but it seems it isn't good public relations to just send her a polite note telling her we have more suggestions than we can ever use from our own people. If there's one thing we don't need, it is ideas from folks outside our own organization. What's all the fuss about?"

Mr. Spardleton shook his head at Mr. Shannon and said, "Don't you know that you great big corporations can't go around sucking the life blood out of poor little housewives who give you these valuable ideas so you and all your executives can get rich and join the best country clubs and play golf all day?"

I understood the way Mr. Spardleton talked, and Mr. Shannon did, too. "Like that, huh?"

"Yes, almost exactly like that, the way the law is now. It is a new version of the Deep Pocket Doctrine."

"The *what* doctrine?"

"The Deep Pocket Doctrine. The doctrine that says that the party to a lawsuit that has the most money will be the one that pays. Never mind who has the right on his side, never mind who is at fault, never mind what the rules of law say, the one with lots of money must pay."

"Oh come on, Helix. You're going overboard to make a point. I'm no lawyer but I can't believe it is bad as all that. Why, we couldn't live under a system as crass as that."

Mr. Spardleton carefully took the cigar from his mouth and looked straight at Mr. Shannon. "Jim, I'm sure you have heard of the rule of law that says that if during the trial of a negligence case the plaintiff mentions to the jury that the defendant is covered by an insurance company, it is grounds for a mistrial?"

Mr. Shannon nodded.

"Well, why do you think that rule is in existence?"

Mr. Shannon nodded slowly. "The jury would not worry about awarding the defendant a lot of money if they knew an insurance company was going to foot the bill. Is that part of your Deep Pocket Doctrine?"

Mr. Spardleton popped the cigar back in his mouth. "Yup. And there's precious little difference between that situation and the one where some modest little citizen sues a giant corporation for stealing an idea. The jury will give the little guy a pocket full of money for no better reason than that the corporation will not miss it."

Mr. Shannon shook his head. "What if the corporation already had the idea?"

"Then, under some circumstances, the corporation might be able to use its own idea without paying through the nose to use it. But it's tough to prove that the company had it all along; it's not the way to bet. It's hard to prove because the jury does not want to believe you. After all, you've got lots of money in a company of this size."

"The tragic part is that all the stuff that comes in is stuff we already have from our own people. We would have to pay to use our own ideas?"

Mr. Spardleton said, "I have a client that manufactures resilient flooring. At least once a week on the average, year after year, a housewife writes in and tells them they ought to manufacture a floor covering that has a map of a town on it complete with roads and houses and driveways so that children could push little cars around on it."

I broke in to say, "Sounds like a good idea."

Mr. Spardleton looked at me sadly, shook his head, and said, "Thirty years ago the company sold such a floor covering. Sales soon petered out. The company conducts periodic market surveys to see what patterns the public wants. It is in a pretty good position to know that a map won't make it any money these days. But the day may come when it finds that the rosy days of maps on floor coverings are back. Lord help it when it does. There'll be a thousand women standing alongside their lawyers at the courthouse, all shouting that the company stole their bright idea."

Mr. Shannon sighed and said, "Well, that's something like what happened to us. We never should have read this letter. But we try to be pleasant to the public; we hate to brush off people. We only allow certain people in the company to read such letters, but this one got away from us. Here, read it."

I crossed over to stand behind Mr. Spardleton as he read it. The letter was written in green ink, and the handwriting was hard to read.

National Chemical Company
Wilmington 2
Delaware

Dear Sirs:

I have a good idea that I have been using around the house here, and all my friends say I should tell you about it and make a lot of money. I have been using your Killum All-Purpose Home Sterilizer for four years and I think it is the best thing for around the house that there is. I've been using it just the way you say on the instructions part, although my husband says I never read the labels, but I do. Then about a year ago I got this idea while the rugs were out being cleaned. What I did was soak the rug pads in the Killum All-Purpose Home Sterilizer. I poured it on real thick and let it dry overnight, and then when the rugs were put back on, there was a layer of Killum All-Purpose Home Sterilizer right under the carpet. I have no flies or mosquitoes or ants in the house ever.

Since I have three small children, two dogs, a cat, a rabbit, three turtles, a snake, two parakeets, and some guppies (I don't know how many, I haven't looked today), you can see I have the kind of a house that fills up with flies quite easily. I forgot to say, my three small children are all boys. I was going to put some Killum All-Purpose Home Sterilizer on the curtains and draperies, too, but I don't seem to need it there. The rug pads keep the house free of everything.

That is my idea and it is a good one. Two of my good friends have done the same thing now, and they say it is just grand and that I should write to you and tell you so you can tell everybody about it, and that way you can make a lot of money too. Please tell me what you think.

Yours truly,
(Mrs.) Sally White

P. S. My rug pads are made of foam rubber.

S W

When Mr. Spardleton finished he murmured, "Oh my."

Mr. Shannon said, "Well, I'm not finished yet. Let me tell you the rest of it."

"Let me guess," said Mr. Spardleton. "First, somebody in your company, completely without authority told Mrs. White that she had a great idea there and the company was going ahead and use it."

Mr. Shannon nodded.

"Second, it now turns out that your company has just discovered that the hottest potential money-maker it has is this insecticide in a rug pad."

Mr. Shannon nodded and started to speak, but Mr. Spardleton held up his hand and said, "The only possible way to make the system work is in a foam rubber rug pad."

Mr. Shannon's mouth dropped open.

"Also, you now find that many people have been talking about this kind of a product for a year or two, but you are not able to find a memorandum, or a letter, or a notebook, or anything else that describes it as clearly as Mrs. White's letter."

Mr. Shannon leaned back and spread his hands and said, "The only thing you haven't mentioned is that practically our entire legal staff is busy with this proposed merger with Chifron Paint and Chemical Company, and the merger has some antitrust implications. This would be a bad time for a lot of adverse publicity."

Mr. Spardleton looked at the letter again, shaking his head. "It's undated, it asks for money, it fairly describes your product, it's a housewife with small children, it's a good idea. Can you imagine what a jury will do with that?"

The room was quiet. I said, "Why don't we pay her?"

The room stayed quiet and I grew concerned for a moment until I realized that the two of them were thinking. Mr. Shannon said, "What do you think, Helix?"

"A possible solution. If we cannot demonstrate with

great clarity that we had the idea before Mrs. White wrote in, we had better consider paying her. Litigation through a Court of Appeals could cost us twenty-five thousand dollars, so we'd be ahead of the game if we paid her anything up to that. The only thing that could be worse . . ."

A secretary opened the door and said to Mr. Shannon, "I have a telephone for you, sir. I told him you were in conference, but he said he's a lawyer, and that you would want to talk to him no matter what kind of a conference you were in."

Mr. Spardleton said, "Did he by any chance tell you his name, Miss?"

"Why, yes. It was Mr. Bloodletter. I sort of thought he was fooling."

"He wasn't fooling. Please transfer your call to Mr. Shannon's phone here. I will take it in here."

She looked at Mr. Shannon, who nodded, and she left.

"That's what I was about to say was the last thing that could be worse. If Mrs. White has old man Bloodletter on her side, we have a problem."

The phone rang. Mr. Spardleton walked over, picked it up, and said without preamble, "Hello, Charlie. This is Helix Spardleton. I'm sure you'd rather talk to me than my client. What's on your mind?"

It must have been a shock to Bloodletter to be greeted like that, rather than by an easily intimidated vice-president, but it didn't slow him down. I could hear the other voice over the phone, and he was talking earnestly the instant Mr. Spardleton stopped. One thing about patent lawyers, they are used to surprises.

We all could hear Bloodletter's voice. It wasn't loud, just penetrating. When it finally stopped Mr. Spardleton said, "Oh come now, Charlie. This product has been under development for a year here. You don't seriously think your client came up with something new, do you?"

Apparently Bloodletter did. We could hear his voice for a moment, and then we heard a loud click. Bloodletter had hung up.

Mr. Shannon said, "Does he always hang up without saying good-by?"

"Always. Well, we are either going to have to prove we had this product or we are going to have to pay. Bloodletter is the most aggressive lawyer in the business. I don't know how Mrs. White found him, but it shows she means business, too."

"What do we do next?"

"We try to find some evidence. And we try to find it within one week. Bloodletter wants me to show up in his office one week from today with a check or with evidence that will persuade him his client has no cause of action."

"How much does he want?"

"What else? One million dollars."

It was a busy week. Mr. Spardleton and I both talked to innumerable people. We spent most of our time at the central research laboratory at Wilmington, but we

then had to climb in and out of innumerable airplanes to go to a series of plants scattered all over the country. The National Chemical Company was decentralized, and as far as I was concerned, "decentralized" meant that nobody in the Company knew what anybody else was doing.

At one of the subsidiaries I found that a chemical engineer had filled a Record of Invention on the pesticidal rug pad because he was certain he had thought of putting the cells in the rubber containing the pesticide. The Record wasn't completely filled out because nobody had paid much attention to it. But it was something that showed that the rug pad had been in the company before Mrs. White's letter had arrived. I felt pretty proud of it as I showed it to Mr. Spardleton.

"You certainly had better luck than I did, Carl." I could feel my chest swell up, and he continued. "But I'm very much afraid that it isn't good enough."

My jaw dropped. He said, "Remember, we have a case of a housewife against a giant corporation. Bloodletter would have the jury thinking we had whipped up a few false papers and a little false testimony for the occasion. We need a case that is so clear and convincing that even people who don't want to believe us will nevertheless have to believe us."

"Will a jury be that bad?"

He sighed. "Something happens to an intelligent person when he sits on a jury like this. Look at what juries are doing to the medical doctors. I know doctors who now avoid the scene of an accident. As soon as the person injured gets well, he sues the doctor who happened to arrive at the accident scene for malpractice on some pretext or other. Everybody knows doctors carry insurance for that sort of thing, and besides, all doctors are rich in the view of juries. He can afford to pay out a few thousand more or less to some poor injured plaintiff. It's the Deep Pocket Doctrine in another guise. If somebody seems to be in sort of a bad way, why, make somebody with money cough up and pay him. It's an offshoot of government handouts to all sorts of groups. People are getting so used to getting money without working for it that the courts are now an instrument for spreading it around. Well, let's keep digging. We don't have to confront Bloodletter until the day after tomorrow."

But when we did confront him, we were no better off. The only thing I had found out was that a law school friend of mine was a patent attorney for the company that National was getting ready to acquire. Things were so hectic I did not have a chance to talk to him before our appointment with Bloodletter.

Mr. Spardleton and I went to the Connecticut Avenue office of Bloodletter and the receptionist told us to go right on in because Mr. Bloodletter was waiting.

It was a dark, gloomy office, with deep, dark-brown rugs and near-black mahogany furniture. The walls were ochre and the pictures that hung on the walls were all scenes from Dante's Inferno. A middle-aged woman was sitting in one of the chairs, smiling pleasantly at us as

we went in. I knew it must be Mrs. White. A man stood near the window. I looked at him, and instantly felt myself drawn to him.

He was quite small, and he had a round, finely chiseled face with a little nose, plump little cheeks, a round chin with a little dimple in the center, and a pair of large brown eyes that sparkled and snapped and had just the merriest look about them. He had a peaches-and-cream complexion and a little potbelly, and he looked like nothing more than a tiny Dresden doll. He just made me feel like putting my arm around his shoulder, but I knew that would never do. I walked up to him and held out my hand and said to him, "How do you do, sir. My name is Carl Saddle and I do not believe I have had the pleasure of meeting you."

He said, "I have no interest whatsoever in meeting you, and I do not wish to shake your hand."

"Oh, I'm sorry you . . . wha . . . wha . . . what?"

"Bloodletter," said Mr. Spardleton—and for the first time I knew who the Dresden doll was—"I had hoped we could be pleasant as we worked this out. But if this is the tone you want set, why we'll be glad to maintain it."

Mr. Spardleton swung around and said to me, "Would you care to start the proceedings by presenting some of the evidence you turned up last week?"

I gulped and found my voice and started with the Record of Invention. I worked around to the supporting statements I had collected, talking quietly and with the authoritarian tone of voice Mr. Spardleton had taught me. I'm afraid it did not impress Mr. Bloodletter.

He looked at me coldly, his delicate nose turned up, and the edges of his mouth turned down. He said, "Your evidence, Mr. Saddle, stinks. There isn't a jury in the country that would be persuaded by it. All of it is self-serving."

Mr. Spardleton leaned forward and said softly, "Oh, I don't know. Look at the case of Lueddecke v. Chevrolet Motor Company. Lueddecke told the company that he wanted to submit an idea, but the company told him to apply for a patent first. Lueddecke sent in his idea anyway. It was a good one, too. He told them they ought to strengthen the springs on the driver's side of the car to compensate for the fact that the driver always sat on one side of the car. The company did it, and Lueddecke sued. Do you happen to know the result, Mr. Bloodletter?"

Mr. Bloodletter waved his hand depreciatingly, but Mr. Spardleton did not give him a chance. "The court found that all Mr. Lueddecke did was tell the company to straighten up a car body that was lopsided and that he had voluntarily disclosed his idea without a contract. Does that sound familiar, Mr. Bloodletter? Does your client have a contract?"

"You quote old law, Mr. Spardleton. I don't suppose you have ever heard of Liggett & Myers Tobacco Co. v. Meyer, a fine Indiana case. Meyer sent in a letter just as my client did, giving an idea for billboard advertising.

You may remember the campaign? Two well-dressed gentlemen, one offering the other a cigarette, the other replying, 'No thanks. I smoke Chesterfields.' The jury brought in a nice verdict for Meyer. The Indiana Supreme Court affirmed on appeal. Care to discuss it any further?"

"Certainly. Consider the case of Irizarry v. President and Fellows of Harvard College. Dr. Irizarry corresponded with Dean Griswold of Harvard Law School about a loose-leaf tax service for eight Latin American countries; he wanted the Dean to look over the idea. Their correspondence stopped and later Harvard Law School came out with a publication of foreign tax information in conjunction with the United Nations. Dr. Irizarry sued saying that the idea was his and he ought to be paid. The court said no; a voluntary submission of a subject that was already old was not enough to support a judgment. The court threw him . . ."

Bloodletter was on his feet, his fine complexion a slight pink. "Do you mean to insinuate that my client's idea was old? Just show me, if you can. Just show me. Haven't you ever heard of the case of Smith v. Dravo?"

Mr. Spardleton made no response, but I could tell from the set of his jaw that he did not think things were going well. Bloodletter continued, "The plaintiff Smith disclosed details of a shipping container to the defendant, who then made and used that type of container, refusing to pay the plaintiff. The defense was that anybody could inspect the containers that were being used in the open trade and learn how to make it just by looking at it. You know what the court said? It said that the fact that a trade secret is of such a nature that it can be discovered by fair and lawful means does not deprive its owner of the right to protection from those who would secure possession of it by unfair means."

I could not believe it. I said, "You mean the holding was that anyone in the country could make such a container except the one the plaintiff described it to?"

"You catch on fast. And you may be bright enough to see that my client is in even a better position."

I said, "Not as I see it. We ourselves made this invention before your client ever sent us a letter." I could see Mr. Spardleton nodding out of the corner of my eye, and I knew I had hit the right argument.

"With this faked evidence you can't prove anything." I started to get up, but Mr. Spardleton's voice cut in.

"What about Williamson v. New York Central Railroad. Or don't you remember unfavorable cases? Williamson sent in a suggestion to the railroad that they set up a miniature display at the New York World's Fair. The railroad did, and Williamson sued. The court held against him, told him he could not collect for an abstract unimplemented idea without concrete form—no property right in it."

"But," shouted Bloodletter, "the suggestion of my client was not in abstract form. It was a complete concept, it was . . ."

Mr. Spardleton effortlessly raised his voice louder than Bloodletter's. "What was the pore size of the cells in the rug pad? What percentage of each cell was filled with the pesticide? How thick was the rug pad for optimum efficiency? What was the wall thickness of the individual cells to allow diffusion of insecticide vapor? What carrier do you use with . . ."

"Details, details. Anybody can work out the. . ."

"Details, my foot. They are the difference between a useless product and a marketable product, and your client did not have the first thing to say about them. There's over a year's work involved to get these 'details' that your client knows absolutely nothing about."

The woman nodded to Mr. Spardleton and started to say something to Bloodletter, but he waved her quiet. I had forgotten she was there. Bloodletter said, "Still details. You might be familiar with the 'Mr. District Attorney' Case, *Cole v. Phillips H. Lord, Inc.* Plaintiff sent in a script of a proposed radio series to be entitled 'Racketeer & Company'. Defendant used the idea under the name 'Mr. District Attorney'. And he paid for it, too."

"Not in point. The. . ."

"Or *Stanley v. Columbia Broadcasting System*, where the plaintiff submitted a script to see if CBS wanted to buy it or license it. They used it without payment and Mr. Stanley was awarded thirty-five thousand dollars."

"Oh certainly. The idea had been reduced to a concrete form, and it was for the court to find an implied contract to pay if the company used it. We have no such set of facts here."

Bloodletter looked at him, shaking his head. He said, "I do not find you persuasive, Mr. Spardleton. Are you prepared to discuss a settlement with my client, or shall I recommend that she file an action against your client, an action, I might say, that I have every reason to believe I would win."

"Oh yes. To save us the chore of digging further through company records, a week's work, perhaps, we will be willing to pay . . . oh, let us say . . . a thousand dollars."

Bloodletter walked across his office to the door, opened it, stood near it, and looked at us expectantly. Neither one of us moved, and the silence grew heavy. Finally, Mr. Spardleton said, "You haven't answered, Mr. Bloodletter. Do you want time to think it over?"

"I do not."

"Then there is nothing further for us to discuss at this time." He nodded at me, we got up, nodded at Mrs. White.

As we went out the door, Mr. Bloodletter said, "See you in court."

"Most assuredly," said Mr. Spardleton, and on we went.

In the taxi I said, "He seemed to know his cases. Was he stretching them?"

"No. He has cases he hasn't even used on us yet. They are all a little off the point from our case here, but that won't stop Bloodletter. Take *Elsenbein v. Luckenbach*

Terminals, Inc., a New Jersey case. A firm of accountants wrote the company saying they had discovered that the company had been making a needless expense of some \$1,400.00 per year. The accountants said that if the company would pay them fifty per cent of the first year's savings, they would tell the company how to save. If there were no savings, the company wouldn't owe them a thing. The company wrote and said, 'Advise us what you have in mind.' So the accountants explained that by changing its \$100.00 stock to no par stock, the company would reduce its tax from \$2,000.00 to \$600.00 and that they could reduce the number of shares outstanding and use careful timing and make even further savings. The company did all this within the week and saved \$1,994.00 the first year, but they would not pay the accounting firm one red nickel. The accountants sued. What result?"

I had been trapped before by this kind of thing from Mr. Spardleton, and I was cautious. "Well. . ." I decided to take the bull by the horns. "They recovered half."

"Very good. Now how about the New York case of *Soule v. Bon Ami*. The plaintiff wrote to the company and said he could tell it how to increase its profits without loss of sales. The company agreed to pay Soule half of the profits of any increase. Soule told it that his study had showed that grocers would be satisfied with a thirty-three per cent profit instead of the forty-four per cent profit they had been making, so the company should increase the price of its product to from \$10.00 to \$10.50 or \$10.80 per gross. The company jacked the prices a little more than that, made a greatly increased profit, and refused to pay Soule a cent. What result?"

I looked at him suspiciously, and he chuckled. "Right again. Soule lost his case on appeal in a confused and unclear set of opinions from the judges. Don't ask me to square it with the case where the accountants recovered; it can't be done. Some of the cases—but not all—seem to turn on the adequacy of the contract, as if the defendant said, 'If I had known that was all you had to offer, I never would have made the agreement.' But those cases are older ones. Judges these days seem to look for ways to make a company dig up money to pay over to plaintiff on a shadow of a pretext."

I shook my head and sat quietly.

He said "Then there's *High v. Trade Union Courier Publishing Corporation*. The plaintiff told the company that he would give it information that would enable the company to avoid payment of telephone excise taxes if the company would pay plaintiff a specific portion of the savings. The company agreed and so the plaintiff told it that it was exempted from paying the taxes at all. The company was disgusted and refused to pay. What do you think the court did?"

I quoted, "If I had known that was all you had to offer I would never. . ."

Mr. Spardleton was shaking his head. "Nope. The court made the defendant company pay what it had said it would."

I said, "They don't make very much sense, do they?"

"None at all that I've been able to find. Try *Masline v. The New York, New Haven & Hartford Railroad Co.*, a Connecticut case. Plaintiff offered to give the railroad an idea that would be profitable if the railroad paid him a commission. The railroad agreed, so Masline told it to sell advertising space both along its right-of-way and in its cars. The railroad refused to pay. Care to comment?"

"No, sir."

"You are learning, Carl. The court took the position that the information was not new, and it threw Mr. Masline out of court and didn't give him any money as he went by."

"That's why you think we are in a bad way with this rug pad thing."

"Yup. The law of trade secrets is all mixed up with the law of confidential disclosures, and all of it is dominated by the Deep Pocket Doctrine."

We sat quietly and looked at the scenery go by at the airport approach. On the plane back to Wilmington we talked desultorily about where to look next. One of the difficulties of making a careful search in the first place is that you can't think of any better place to look when you can't find anything. Even Mr. Spardleton could think of nothing better than circulating a memorandum to all technical personnel asking them to come forward if they had anything in writing relating to the rug pad development. It wasn't much, but it seemed to be all we had left.

First thing next morning I arranged for distribution of the company-wide memorandum. I called Ed Dafner and we arranged for lunch together; he was the attorney with the company that National was about about to acquire. I took care of some other chores and then went off to meet Dafner.

While we were looking over the menu he said to me, "Why so glum, Carl. Last time I saw you I couldn't have found a more cheerful guy. You look like you've lost your last friend."

"It's this case I'm on, Ed. We're having trouble proving our side of it."

"What's it about?"

"Oh, National slipped up and let a letter from an outsider circulate around the company for six months. The letter suggested a product the company had had under consideration for a year, but we can't prove it. Now we'll either have to drop it or pay through the nose. Good product, too. A pesticidal rug pad that keeps the house free of insects of all kinds."

He said, "Don't tell me it is a foamed rug pad with a closed-cell system carrying the pesticide inside the cells."

I knew my mouth hung open, but I couldn't help it. "How did you know?"

Well, my great friend and law school companion and most priceless acquaintance at the moment proceeded to tell me how he knew, and soon I had my wits about me and I began talking, and each of us got too excited to eat.

We worked together all afternoon, and when I joined Mr. Spardleton in the hotel that evening, I was quite sure I had done things just the way Mr. Spardleton would have. I walked in with a big roll under my arm and rolled it out on the floor in front of him without saying a word. He looked at it quietly, and looked at me, and blew out a long thin stream of cigar smoke and said, "I detect in your manner a certain quiet conviction that shrieks that you have got this case nicely tucked away on ice. Would you care to tell me about it, or would you rather I guess?"

I started to ask him to guess, but I was afraid he would be right and then I wouldn't have the fun of telling him. "I'll tell you. The company that National is about to acquire brought the rug pad to a marketable state just thirteen months ago. They have quietly been test marketing it in Casper, Wyoming; Roswell, New Mexico; Franklin, Virginia; and Yakima, Washington, for a period of one solid year. Furthermore, Ed Dafner has had a patent application pending for the year, and has just supervised filing foreign applications on a world-wide basis. This, I pointed to the roll on the floor, "is a specimen of the rug pad that has been on the market for a year, and this," I dropped a file in front of him, "is a copy of the United States patent application."

He didn't even look at them. He said, "Have you considered the best way to ram all this material down Bloodletter's throat?"

"Yes, I have. We've got our proof now. National can have its new company sell the rug, so there's no problem there. We could sue Bloodletter's client in a declaratory judgment suit since they've threatened us. Or we could wait for him to sue us and then clobber him with our evidence. Either of these would be a delight. I'd love to see him squirm."

Mr. Spardleton sat quietly, the smoke curling slowly toward the ceiling.

"But," I said, "that's a luxury that would not be fair to our client, the National Chemical Company; we would sort of be using the Deep Pocket Doctrine ourselves just because National has a lot of money. So our course of action as I see it is to set up another meeting with Bloodletter, show him our best evidence to persuade him that a lawsuit will not be in the best interests of his client. I think he'll buy it."

He sat there for a while, so long that I was sure I had blown it again. I must have overlooked something, and I frantically reviewed the situation in my mind. Then he said, "Carl, that was spoken like a lawyer. I'm sure Bloodletter will let go. Tell me. Do you know anything about partnership law?"

I shook my head, puzzled.

"Well, once you settle this Rug Pad Case, look up some partnership law and come in and see me."

I nodded, still puzzled. But I was too busy thinking of how I was going to handle Bloodletter to worry about anything else right at the moment. ■



SITUATION UNBEARABLE

HERBERT PEMBROKE

Sometimes the surest, most effective answer to an age-old problem is quite simple—and so utterly detested that no one will accept it. Until it's absolutely unavoidably forced upon them . . .

ILLUSTRATED BY MICHAEL ARNDT

The bullet snapped by my right ear with a noise like that of a cracking bullwhip.

I spun with it and dropped, my ear ringing like a struck gong.

There was nothing to hide behind on the ramp of the jet plane that I had been stepping out of, but within half a second there were ten or fifteen people gathered round me. The would-be assassin, whoever he was, had picked a poor time and place, I thought.

Then I noticed that there was someone else sprawling on the steps just above me. The bullet that had missed

my ear had gone through the heart of Dr Vladimir Karsov, who had been coming down the ramp only a step or two behind me.

The shot had not come from nearby. There was no odour of cordite, as there would have been from a pistol, even a silenced one, used nearby. Besides, I know the crack of a high-velocity rifle bullet when I hear it.

None of the bystanders was yet aware of what had happened. The stewardess of the big BOAC jet was still standing at the head of the ramp, looking down the stairway at me and Karsov, wondering what had happened. Two muscular-looking men were standing on the steps between her and Karsov, having come to a dead halt when the Russian and I dropped. I was thankful that I had been able to control the almost automatic reflex that had made my hand start for my armpit as I dropped. The men were Karsov's "bodyguards"—actually a couple of MGB men who had been assigned to keep an eye on the illustrious Russian geneticist.

The eyes that they had kept on him had not lengthened his life one second.

The babble of voices washed around me as everyone became more and more excited. I ignored it and got to my feet.

"You hurt?" a little elderly man with an American accent asked me hurriedly. "What happened? What's the matter with the other guy?"

"I'm all right," I said. "I heard a noise, that's all. I don't know what happened." I wanted to stay out of it, to blend in with the rest of the crowd. I went on down the last two steps, then turned and looked, just like everyone else.

One of the MGB men was kneeling beside Karsov. The other was standing, surveying the surroundings with cold grey eyes. He was particularly interested in a tall building a hundred yards away across the airfield. I figuratively tipped my hat to him; he, too, had recognized the snap of a rifle bullet and knew that the shot had not come from nearby, and the noise hadn't been as close to him as it had been to me.

But, whatever happened now, there would be the devil to pay. A Russian passenger on a British aircraft had been shot on American soil. This was one murder that would not be taken lightly by any of the people concerned.

And yet, I was thinking, what is a single death more or less when the entire human race is dead on its feet already?

* * *

That was almost exactly what Sir Martin had said to me when he gave me my assignment.

The trunk call he put through to me was quite explicit in its vagueness. He said, quite simply, "Britton? Sir Martin here. We haven't seen each other for quite a time, have we? I was wondering if you mightn't feel like dropping by for lunch—on me, of course. Talk over old times. Have a couple of drinks. How about it?"

I knew exactly what he meant. "England needs you, Geoffrey Britton. There is work to be done. Come." But you don't say those things over a telephone.

"Glad to, Sir Martin," I said. "What time and where?"

"Oh—say, half past one. My club. Can you make it?"

I looked at my watch. He meant one o'clock at his office. After that, we'd meet at his club and actually have lunch. I had plenty of time to drive down to London. "Certainly, Sir Martin. I'll drive down. One thirty, then."

"Excellent. See you then, Britton." And he rang off.

The weather was perfect for motoring—bright and sunny, with only a few scattered clouds. It was the kind of day that made one agree with the poet who wanted to be in England, "now that April's here."

It even made the colours on the hoardings stand out, so that one could almost appreciate the beauty of being told to use Pear's soap or to drink Bovril. By the time I reached London, I had even decided that a Guinness would be good for me.

I parked my MG near Sir Martin's office and went into the saloon bar of the nearest pub for a thirst quencher—to wit: a pint of bitter mixed with a bottle of Guinness. I had nearly twenty minutes before I was due at Sir Martin's office, and it would be as bad to be early as it would to be late.

And it was in that pub that I first heard the rumours

that were even then beginning to spread.

The fat man sitting at the next table with an older, thinner man wearing a Guards moustache was saying: "... Brown says it's slackening off something fierce, and Dr Brown knows what he's talking about. He got a letter just last week from another medical chap he knows in India, and the birth rate's going down there, too."

The man with the moustache scowled. "I shouldn't be surprised. All these do-gooders and their birth-control pills. Especially the Americans. They've put God knows how many billions of dollars into shipping the things to India and putting out propaganda to induce them to use the pills."

"*With the active assistance of the Indian Government,*" said the fat one admonishingly. "Don't ever forget that. And don't forget the fact that an awful lot of those pills were made right here in England. You can't blame the Americans for everything."

"I'm not. But it's not right, all the same."

The fat man chuckled. "Trouble with you is, you've a single-track mind, George. Half a billion people or more in India, not growing enough food to keep half of 'em decently fed, but you'd rather see 'em starve than see 'em use birth control."

George-the-Moustache signalled to the innkeeper for another drink and said to the fat man, "It's a matter of Christian morality. It isn't right that—"

"Bless you, George," the fat man interrupted with some asperity, "*they* ain't Christians—much less R.C.'s."

George-the-Moustache chuckled and said, "Next thing, you'll be calling me a 'bloody papist', Harry."

"Not a bit of it," Fat Harry said. "A man's got a right to his own religion, I always say. But that don't mean he should push it off on others. Like this birth control thing—"

It was The Moustache's turn to interrupt. "Now wait! I've heard some of your High Church clerics say—"

I didn't wait to hear what George had heard some High Church clerics say. If this was going to develop into a religious argument, I didn't want to hear any of it, even if it was friendly. I finished my beer-and-Guinness and left.

At one minute of one, I stepped out of the lift that had opened at the floor where Sir Martin's office was located. I went into the outer office, where Sir Martin's secretary was sitting behind a desk. She glanced up as I came in, flashed me a smile that was all white teeth, warm lips and sparkling eyes, and said, "Happy to see you again, Colonel Britton. You're to go straight in." Then she closed one eye in a wink. "Just got in himself half a moment ago," she added softly.

"Thanks." I returned her smile and headed for the door to Sir Martin's private office, thinking that no one had called me "Colonel" for some time. Titles are queer things, anyway. In America, everyone insisted on calling me "Doctor" because of my Ph.D.; in France it was

"Professor"; in Germany, they went the whole way and said "Herr Professor Doktor Oberst." If—as was highly unlikely—I were ever to appear in the Peerage section of the Honours List, the Germans would have a fine time with the whole title.

If Sir Martin had been behind his desk only half a moment, he certainly didn't give that impression. As always, he looked as though he had been planted on his chair as a young sapling and had grown to a sturdy oak in that same position.

"Afternoon, Britton. Sit down." He waved me to a chair as though we'd been working together without a break, as though he had seen me every day for the past five years. He knew he didn't have to ask me if I wanted to go back to work.

I was well aware that he wouldn't have called on me except in an emergency. He knew that, and he also knew I wouldn't refuse if it was that important.

He pushed a large, thick envelope across the desk toward me.

"Read that," he said. Then he swivelled his chair round and looked out the window, ignoring me.

I opened the ten-by-fourteen envelope and took out a thick typescript. Then I lit a cigarette and settled myself to read.

Some of the data were no news to me, but the conclusions certainly were. Aside from the written exposition of the case, there were page after page of graphs and mathematical extrapolations.

And if they meant what they said, the world was coming to an end.

When I was through, I put the typescript back in its envelope and put it back on Sir Martin's desk. Instantly, he swivelled round again and looked straight at me with those piercing blue eyes of his.

"The human race is dying, Britton," he said. "Within a few months, it will be nothing but a walking corpse." Sir Martin has a sense of the dramatic that is meant to be impressive—and is.

"I've just come from Whitehall," he went on. "Extraordinary measures will have to be taken if anything is to be salvaged; they are all agreed upon that."

I knew who he meant by "they." It had been in all the newspapers. Even so, it hadn't really been news. The Prime Minister, the President of the United States, the Executive Secretary of the European Coalition, and the Premier of the Soviet Union were having another Summit Meeting, and what, pray tell, was new about that? Certainly it had not occurred to anyone that anything worthwhile would be accomplished by another of those interminable Summit Meetings.

"As of this moment," Sir Martin continued, "the information has not been made public. The Sovereign has, of course, been informed of the gravity of the situation, as have the Privy Council. Outside the cabinet, there are only a few Members of the Government and the Opposition who know—and they are keeping their mouths shut."

As he spoke, he opened the cigarette box on his desk, selected one, then offered the box to me. I took one, and he lit both cigarettes from his desk lighter.

"Unfortunately," he said through a soft cloud of smoke, "that situation won't last long. Sooner or later, someone who can't keep his mouth shut is bound to notice—and I should say that it will very likely be sooner. The data can't be hidden, of course. They're available in every maternity ward in the civilized world. As soon as some blabbermouth grasps the implications of the overall picture—" He spread his hands in a gesture of futility.

"That, of course, is neither here nor there, as far as we are concerned. Nor are we concerned with the primary aspects of the solution to the problem—if one exists. With the obvious exception of yourself, we are not biochemists or geneticists or whatnot. There is, fortunately, something we *can* do."

He paused to let me wonder what he meant. I obliged him by doing so, but I came up with no answers. What can a cloak-and-dagger organization do to change the course of a declining birth rate that is dropping logarithmically toward zero? As for my own work, I was quite certain that Sir Martin did not want me to solve the problem all by myself. My specialty was viruses, not human genetics. I simply looked at him and waited for him to go on.

"Scientists from all over the world will be called in to help," he continued after a moment. "All the major biochemists, geneticists, biologists, and medical research men from both sides of the Iron Curtain. Naturally, certain precautions must be taken. We shall have to make certain that there will be an equal sharing of the data and so forth produced by this joint research project. We shouldn't like the Soviets coming up with an answer and refusing to let us in on it." He tapped the ash from his cigarette and looked at the glowing end as though it were a vital clue to whatever mystery he had in mind.

"We will have agents from both sides watching the scientists," he said, "and agents watching each other. Routine, of course. That will, for the most part, be up to Scotland Yard—CID, and the Special Branch. The American FBI will take care of their end of it. But you will have a real job of work to do." He looked at me, and there was more than the hint of a twinkle in the old man's blue eyes.

If that last sentence has given you the notion that Sir Martin was a superannuated fossil, forget it. He was still on the fresh side of sixty and looked fifteen years younger. The "old man" refers to his position—like that of a ship's captain.

"Am I supposed to look terrified, worried, or just blank?" I asked.

"Attentive." He tapped a folder on his desk. "We have some men to find. Scientists specializing in human genetics, birth control methods, fertility problems, et cetera. Men brilliant enough in their fields to be considered in-

valuable in the problem we have to tackle here. By far the greater portion of them are from behind the Iron Curtain. You will recall the activities of the Retribution Society."

I did. The Russians had taken a dimmer and dimmer view of those who had managed to escape the grasp of the iron fist of the Soviet. The Retribution Society had been their answer to the problem of what to do to inhibit the escape of useful or important people.

The Soviet Union had, of course, denied the existence of any such group, or, alternately, denied that any such group, if it did exist, had the official sanction of the Soviet Union. Naturally.

But it existed, and it was backed by money and influence of the kind that only the Soviet Union or some other equally wealthy country could command, and it specialized in the kidnapping or assassination of those who had escaped from behind the Iron Curtain.

It is inherently impossible to protect any human being against a determined assassin who is willing to die to achieve his goal. For those who attempted to escape Communism, there was no more freedom on this side of the Curtain than on the other.

To combat that situation, we had, in co-operation with the American CIA, organized what the Americans called "The Underground Railroad"—referring to a somewhat similar operation that smuggled Negro slaves out of the Southern States and into Canada just prior to the American Civil War. The primary purpose of both Underground Railroads was the same: to make certain that the escapee was safe.

It was complicated and expensive, but it was worth it. The word had been passed throughout the Communist countries that any escapee was to report immediately to the nearest British, American, or other free Embassy or Consulate. From there, he vanished, never—we hoped—to be seen again. He was provided with a new identity—background and papers, complete and authentic. And plastic surgery if necessary.

The Russians, of course, were well aware of what we were doing. Their method of fighting it was to spread the rumour that the reason escapees vanished was that they were either done away with or enslaved by the "vicious Capitalist bosses" of the free world. And the Retribution Society doubled and redoubled their determined efforts to find those who had made their way to freedom. More often than we liked, they had been successful.

If it was at all possible, the Society kidnapped their man and brought him back to Communist territory. If not, he was murdered out of hand.

In retaliation, we sought out members of that Society and disposed of them, although, as far as I knew at the time, we had not yet broken the organization itself.

Sir Martin tapped the ash of his cigarette again, and this time he looked at the ash itself for the clue he seemed to be looking for.

"As you know," he said rhetorically, "not all our es-

capees trusted us. They again changed identities and took up their lives free from both ourselves and the Retribution Society. The most intelligent of these have, as far as we know, done very well. We wished them best of luck. But now it is necessary to find some of them, and that will be our own cross to bear. We must not only find them, but convince them that they must come out into the open and work with their colleagues to save the life of the whole human race. It will not, I fear, be easy to do in some cases."

"One can't force a creative mind to work against its will, sir," I reminded him.

"Obviously not. The trouble we anticipate is that of convincing them that the Retribution Society has closed up shop—at least for the duration of the present crisis." He crushed out his cigarette in the heavy jade ash tray. "As far as you are concerned, however, all that is by the way. Your assignment is of a somewhat different order. I have a dossier here. You'll want to read it thoroughly later, but I'll give you a quick synopsis. Edmond MacCrae, MD, PhD, ScD, FRS, et cetera. Ah! You know him?"

"I know of him," I said. "Professor MacCrae. Cambridge, I think. Got a Nobel prize two years ago for pinpointing one of the complexes in the DNA structure of the Rhesus monkey's makeup which is responsible for the Rh Factor in the blood."

"That's the man. Know anything else about him?"

"Should I?"

"I should hope not. He was one of the best cover jobs we've ever done. Mostly luck. There actually was an Edmond MacCrae, a good, but not particularly brilliant scholar. Few friends, no family. Went to New Guinea for some sort of research. He was murdered there by the natives shortly after a certain highly brilliant and original biochemist left Russia. After some very careful cover-up, that man became Edmond MacCrae, slightly changed in appearance and rather older looking than he should be because of a long illness caused by infection and fever in New Guinea. His English was perfect, so we had no trouble there. He went to Cambridge and accumulated degrees rather rapidly—not surprisingly, in view of the fact that he had already earned those degrees once. He remained a bit of a recluse, naturally, but that was in keeping with the character of MacCrae. So far as we know, no one ever suspected the switch."

"Now I suppose he is expected to be at the forthcoming symposium and is afraid to show up?" I asked.

"I dare say his peers in the scientific brotherhood would be most happy to welcome him," Sir Martin said rather acidly. "Unfortunately, he is not available. He is in hospital."

"Not one of the Retribution Society's 'accidents'?"

"Fortunately, no. When I say 'in hospital', I don't mean that there is anything physically wrong with him. It is not that kind of hospital."

"I see." And I did.

"You can get the exact dates from the dossier, but

about a year ago his home was burnt down. The fire apparently started in his laboratory, which occupied the cellar and a part of the ground floor. It was a country place in Cambridgeshire, rather isolated, and the fire was going strong before anyone noticed it. By the time someone had phoned the local constable and the fire apparatus had come, there was nothing to do but protect the trees and brush to keep the blaze from spreading. Between the action of the fire and the destructive explosions from various carboys of chemicals, the place was utterly destroyed.

"Professor MacCrae was in the United States at the time. When he heard the news, he went to pieces mentally. All his notes for years of experimentation—including those he had smuggled out of Russia—had been burnt, and that hit him pretty hard. In addition, he'd let his insurance policy lapse—hadn't paid the premiums—and most of his fortune was tied up in the house and laboratory. The fire left him with nothing."

"Anyone hurt in the fire?" I asked.

"No. MacCrae had given the servants a holiday—with pay, I might add. He was a decent, open-handed sort. The house was in the charge of a caretaker who lived at the next farm. He came round every day or so to make sure everything was all right. Never went into the laboratory, though; that had been locked. MacCrae didn't want anyone meddling round in his lab, and I can't say I blame him. At any rate, there was no one about when the fire started."

"And where's MacCrae now, sir?"

"In the United States, in a private sanitarium a few miles to the north of New York City. He ran into a bit of luck there. He'd made money, you know; quite a lot of it. He had a knack for stockmarket speculation, in a modest way. He wasn't what one would call filthy rich, but he did well. So well, in fact, that he was able to loan a friend better than four thousand pounds—twelve thousand dollars, to be exact. Strictly a gentleman's agreement and all that."

"I take it," I said, "that the new MacCrae was better at making friends than the old one was."

"Quite so," Sir Martin agreed dryly. "The loan was made to an American psychiatrist, a Dr George Burton—who happens to be in charge of the sanitarium. When MacCrae went dotty, Burton took him in for nothing. Apparently Burton is confident that if MacCrae recovers the professor will consider the debt cancelled—and that if he does not, it is impossible to pay a debt of that kind to a madman."

Sir Martin lit another cigarette. I hadn't yet finished my first.

"Burton," he continued, "made arrangements to see that MacCrae will be taken care of for the rest of his life—or until he regains his sanity. Which is, apparently, unlikely."

"Naturally, we were suspicious. We investigated. Both

the FBI and the CIA gave Burton and his sanitarium a clean bill of health. The arson experts of the CID couldn't do as much for the fire; any evidence of deliberate arson would have been destroyed or masked by the inflammables in the laboratory. On the other hand, there was no evidence whatever that the fire had been deliberately started. They gave us the Scotch verdict of 'Not Proven'.

"Sir Egbert Langsdale himself has made four trips over to see MacCrae. Twice, he went with colleagues. They all agreed that MacCrae is quite hopeless—almost catatonic, I gather. Memory shot. Very short attention span. Just sits and stares for hours."

"Langsdale and the others agree that there is no evidence of physical tampering—brain operations, drugs, or anything of that sort. I think we can safely say that everything is as it appears to be."

So it would seem, I thought. Langsdale had been awarded his O.B.E. for his outstanding work in psychiatry, and, in addition, was one of our own men.

"Langsdale," Sir Martin continued, "also agrees with the American reports on Dr Burton. He's one of the top men in the field, and Sir Egbert says he couldn't get MacCrae any better care anywhere. He's quite satisfied that MacCrae is genuinely a psychotic case and that Burton is doing everything possible for him."

"Very well, sir," I said. "Where do I come in?"

Sir Martin looked at the smoke coiling up from his cigarette. No clue there, either. "Until two years ago, Professor MacCrae was working on the biochemical analysis of the deoxyribonucleic acid of human genes. He had two assistants—Cambridge undergraduates. Then he closed up shop in order to take a leave of absence. He made a trip round the world to get cell specimens for his work. Wanted samples from every possible racial strain of humanity."

"He even took the bit in his teeth and applied for permission to go behind the Iron Curtain. He was granted the permission and was accompanied by two of our agents acting as his assistants. They were there to watch *him*, of course. Nothing out of the way happened. He took his samples and went on. The fact that he had just been awarded a Nobel Prize helped, of course; otherwise he mightn't have been permitted behind the Curtain. Even the Chinese welcomed him."

"He was not recognized, nor was there any *sub rosa* contact between MacCrae and the Russians; two of my best men will swear to that."

"The cell samples he got were quick-frozen and sent back to Cambridge by air. They're still there, in a 'fridge at the Cambridge laboratories. *Not*, fortunately, in his home laboratory."

"He was on the last leg of his tour when the news reached him that his home had burnt."

"And that drove him mad?" I asked.

The questioning tone of my voice made Sir Martin look at me sharply. "Ah. That's the question. Langsdale

is satisfied that MacCrae is insane. He is not satisfied that the shock of losing his fortune was totally responsible for the mental collapse. After all, he had once deliberately given up everything he had earned during his life in Russia. He came here with nothing and had built himself a comfortable life. He could have done so again. It is Sir Egbert's opinion that there was something else on MacCrae's mind—something that was so heavy a burden that the burning of his laboratory was merely the final straw.

"In the light of what we now know, it seems probable that he was aware of what was happening to human fertility as far back as two years ago. We think he was on the track of something. We think he was looking for evidence to prove his hypothesis. We think he was satisfied in his own mind that something had happened, something that would drastically reduce human fertility. He may have felt that he could have done something about it, but that he needed his previous notes to prove to the world that the danger existed or he needed them to attack the problem—or both. In such a case, the destruction of his records might well cause his mind to collapse."

He leaned forward and pushed the folder across the desk to me.

"Here are all the data we have. Study these papers and then get moving. We want to know what it was that drove Edmond MacCrae mad."

* * *

My first step was to interview the two lads who had been MacCrae's laboratory assistants. I made a trunk call to Cambridge and drove up the next morning. At ten o'clock, I was seated in one of the common rooms with Edward Sherrinford, a thin, hawk-nosed young man with only the slightest touch of Yorkshire in his speech. Having just come from the college hall, he was still in academic dress—or, rather, still in the gown, carrying the cap in his hand. The light shining through the mullioned windows on his pale skin and shadowing his deep-set eyes gave me the sudden feeling that I was watching a Fifteenth Century priest stride across the room toward me when he came in.

Then he smiled and said, "Mr. Britton, sir? I'm Edward Sherrinford."

And I was back in the Twentieth Century, speaking to a young man still studying for his master's. He was the elder of the two young men who had assisted MacCrae. His handshake was firm and friendly.

After we had exchanged the usual amenities, I said, "Will the common room remain this deserted?"

He understood me. "Can't be certain, sir. It usually is this time of day, but there's nothing positive about it. If you want privacy, we can go to my rooms. I can make some tea if you'd like."

"Nothing better," I said. He led the way, and I followed him up an ancient stairway to his quarters.

I must admit that I was impressed by Sherrinford.

I had made the appointment by representing myself as being from Scotland Yard, and neither then nor now was there any sign of worry. Either he had a perfectly clear conscience or he was a superb actor. Not that I particularly cared about what might or might not be on his conscience; it was merely a professional observation.

He offered me a comfortable chair, took off his gown, and busied himself with a tea kettle on an electric plate.

"You said this was a matter of some importance, sir?" he asked as he put the tea kettle on the plate and turned the switch.

"Some," I said. "It concerns your work with Professor MacCrae."

His face clouded over. "Oh, yes. Poor old MacCrae." He sat down in a chair before the cold fireplace and stretched out his long legs. "Terrible thing to happen. A fine brain, a fine mind like his, cracking that way." He stared at the toes of his well-polished boots for a moment, then looked up at me with intelligent grey eyes. "It's not anything to do with that, is it, sir?"

"Not exactly. You know about the destruction of his laboratory?"

"Yes, sir."

"All his notes were destroyed."

"Yes, sir."

"Well the fact is that we're interested in MacCrae and his work. He was doing some things for the Government and the loss of his notes was quite serious." That was not exactly true, but I felt that the deception was justified. "We'd appreciate it if you'd tell us anything you know."

"What sort of thing exactly, sir?"

"Let's put it this way: What phase of his work were you helping him with? And what sort of data were in his notes?" I turned over a hand, palm up. "We should like to reconstruct those notes as much as possible, you see."

He took a packet of Players from his pocket and extracted a cigarette. I said, "No, thanks. Just put one out," when he offered me one.

"To be honest, sir," he said, "I don't know precisely what he was working on. That is, I knew he had been working on some sort of genetic classification system, but I don't know what his theories were." He lit his cigarette and got up just as the kettle began to bubble. "I don't think Narsty knew, either."

"Who?"

He grinned. "N. T. Medson, the other chap who was with me at MacCrae's. His name's Nigel Thomas, but everyone calls him Narsty Tystin' Medson."

"I see. Exactly what sort of work did you do for the professor, Sherrinford?"

"Chromatographic analysis, mostly." He measured tea into a Wedgewood pot, then looked up at me. "D'you know anything about paper chromatography?"

"A little. A bit of the unknown is put on the edge of a piece of filter paper and dried. Then an appropriate solvent is allowed to seep through the paper by capillary action, which takes the components of the unknown along

with it at various rates which depend on their solubilities in the solvent, thus separating the components of the unknown."

He stared at me and blinked. "You Scotland Yard chaps have to know more than I thought," he said. "That's the way of it exactly." He looked back at what he was doing and poured boiling water over the tea. He went on talking while he busied himself with cups and saucers and silver.

"That's the sort of thing we were doing for MacCrae, Narsty and I. Routine work, most of it, but it requires a great deal of precision.

"Deoxyribonucleic acid—DNA—is made up of long helical chains of sugar-phosphate groups, each of which has attached to it a nucleotide group. There are four of those: two purines, anedine and guanine; and two pyrimi-



dines, thymine and cytosine. The DNA molecule in a living thing determines its genetic makeup, you see, and that depends on the grouping and order of those four nucleotides.

"The professor would give us a sample and we'd analyse it, putting down the results in a notebook. Then he'd correlate the results from those notes and put the correlations in his own books. It was great training. He'd only take students who'd already proven themselves to be top-notch precision lab men."

There was no boasting there; he merely stated it as a fact.

"Professor MacCrae was a precision thinker himself. One thing he couldn't stand, for instance, was sloppy notebooks—his precision carried over into everything, if you see what I mean. Kept notes of everything—appointments, expenditures, and so on. Knew to a millilitre exactly how much of the solvents and other liquid reagents we had

on hand. Had the dry stuff figured down to the last gramme. We never had to tell him when to reorder chemicals; he always knew."

He sighed as he poured the tea into the cups. "I suppose that it's such tightly-knit minds as his that come unravelled the quickest when something snaps a thread, isn't it, sir?"

"Possibly," I said. "I don't claim to be a psychologist. Do you have the notebooks that you put your analyses down in?"

He looked rather surprised. "Oh, no, sir. The notebooks were kept there in his lab at all times. I dare say they went up along with everything else when the lab caught fire."

"How much of your work do you remember?"

"Well, *all* of it, I should hope. I mean, as far as technique and theory is concerned. But I couldn't possibly tell you any of the results of the individual tests, you know. It would be like a banker's clerk trying to remember every money transaction over a period of a year. Impossible unless you have one of those trick memories that record everything—which I don't."

And that was that. Two cups of tea and forty-five minutes later, I realized that I had gained nothing more. Young Sherrinford actually knew nothing of MacCrae's real work, whatever it had been. He and Medson had been laboratory assistants, not colleagues, of the professor.

The following morning, I interviewed Medson, a pleasant enough young man whose education had failed to obliterate from his speech a flavour which led one to believe that his mother had undoubtedly been nearly deafened by the sound of Bow Bells during her parturition.

There is no point in repeating what he said in full. A few sentences will give the whole of the information I got from him.

"MacCrae was a sound enough man, Inspector. As a scientist, I mean, but 'e 'ad funny ways about 'im. 'E was one of those Scottish Presbyterian types—honest to a fault, if you see wot I mean. But 'e didn't trust anyone else to be as honest as 'imself. 'E always appeared to me to be trying to keep 'is work secret so that no one else could steal the credit before 'e was ready to publish. No use asking 'im any questions about wot 'e was doing; 'e wouldn't give anything but generalities."

I now knew no more about the precise nature of Professor MacCrae's researches than I had two days before. But I *had* learned a few things about the man himself.

The next day, the first news story concerning the dropping birth rate went over the wires. That started the snowball rolling, and within three days the whole world knew the truth—or at least the greater part of the truth.

The major governments gave out news releases that were meant to be palliative, but they were of little use. The announcement of the international meeting of biological scientists calmed people for a little while until

someone realized that such immediate pooling of international scientific research indicated desperation.

We had a list of those with whom MacCrae had corresponded, and I was busily following up what leads we had by interviewing those on the list who might reasonably be expected to have received some sort of hint about his work.

And there wasn't a single scientist in England who had any idea of what MacCrae had been working on except that it was something to do with human genetics and genetic classifications. General notions they had plenty of, but no details. In his letters, he talked more about what other people were doing than about his own work. Most of his correspondents had saved his letters, and they were as uninformative as a newspaper—that is, they contained everything except what I was looking for.

Still, I had to keep trying. There might be someone—

There were no Russians on his list of correspondents, but there was an Indian, a South African, and a Venezuelan. I decided to tackle the Indian first, for I had heard of the work of Dr Gangadhar Gokhale.

The plane connexions were simple as far as Karachi. From there, I had to take a propellor-propelled—if that's the term—plane to Ahmadabad and then a train northward and finally I had to hire a car to get to the little village where he worked, several miles from Udaipur.

It was unbelievably, God-awful hot. Kipling was right about the "Indian solar myth"—it is no myth. But Noel Coward was equally right about mad dogs and Englishmen. The car I had hired was airconditioned, so I really didn't notice anything but the glare of the sun as I drove over the dusty road toward the village. But I knew that the temperature outside was a hundred and something. Evidently the dogs, like the hump-backed Brahma cattle, were quite sane, for they had availed themselves of every square inch of shade and even ignored the intrusion of an automobile by remaining motionless as I drove in.

Finding Dr Gokhale's clinic was not too difficult, although I had to ask directions twice of shopkeepers who looked at me with a combination of disdain and suspicion before answering my questions.

I pulled up in front of the clinic, opened the door of the car, stepped out, and gasped. For the first time, I could understand the practice of sutteeism; the funeral pyre was cooler than the summer heat. I looked up at the two-story building in front of me.

A head popped out of a window on the first floor, a smiling brown face full of very white teeth beamed down at me. "Dr Britton?"

"Yes," I admitted.

"I am Dr Gangadhar Gokhale. I will come right down. But I suggest you park your automobile behind the clinic, for otherwise the heat will melt the plastic." He laughed, and his head vanished.

"Thank you, Doctor. I will." He was right. Leaving the car in the sun would make an oven of it in five minutes. It mightn't actually melt the plastic, but it would make

it too hot to handle. I drove round and parked the car in the shade.

Dr Gokhale had come down to the ground floor by the time I got back to the front door, and was greeting me with an outstretched hand.

"So pleasant to see you, Doctor. Do come in. I have taken the liberty of preparing something cooling on the presumption that, like most Englishmen, a small libation of gin is not contrary to your practice. I am having one myself, and may have more. You are welcome to share with me all that I have, since it is not often that I have so distinguished a visitor." All the time he was talking, he was pumping my hand and leading me toward a table and a couple of very comfortable looking woven rattan chairs.

"I received your wire," he chattered on, "and I said to myself that this will be an excellent opportunity to get rid of the last of the gin and the quinine water and the limes. I hope the fan will keep you cool enough. We have no air conditioner, for the generator is not powerful enough for it. It is a strain on the poor old thing just to keep the refrigerators going. If we could only efficiently convert that solar energy into electrical currents, what a blessing it would be for India, eh, Doctor?"

"It would indeed," I agreed, seating myself in the chair he had urged me towards.

There was a large bowl of ice cubes, two tall glasses, a bottle of Beefeater's, and two bottles of Schweppes on the table, and Dr Gokhale busied himself with them as he talked. "An excellent drink, this. Cooling, and, taken in moderation, very good for the health. Do you recall the story of its invention, Dr Britton? While it is, indeed, an English invention, it was invented here in India during the last century. Malaria took a great toll of British soldiers in those days, and the only preventive was, of course, quinine. Unfortunately, it was difficult for the Queen's officers to get Tommy to take his regular dosage. Quinine was not dispensed as a pill or a capsule in those days. No, it had to be taken in solution, by the tablespoonful—and it was bitter, as you know. Very bitter indeed. Your British soldier hated the taste of the stuff and did everything he could to get out of taking his dose. As a result, Tommy caught malaria and died—regularly. The problem was solved in a satisfactory manner by one of your English officers—I forget who at the moment—by simple psychology. He mixed a tot of gin with the dosage. A good glass of gin with a spoonful of quinine solution in it might taste horrible to Tommy, but the taste was but momentary while the effect was more lasting. Eventually, Tommy got to liking the stuff. Of course the drink that we appreciate so much today contains much less quinine and less gin, but that has merely served to improve the flavour while retaining the effect, eh? Here."

He handed me a drink. A very welcome drink.

"Well, Doctor!" He raised his glass. "Cheers!"

"Cheers, Doctor!"

But his smile had vanished when he put his glass down. The change was so great that I asked: "What's the matter, Doctor?"

He lowered himself slowly into the rattan chair before he answered. "Oh, nothing. I was just thinking. We have a toast in India: 'May your children live on forever.' That's a literal translation. It means, rather, 'May your family—your children and your children's children and so on—live on forever.'" He waved a hand around. "That is why there is no one here but myself."

I wasn't quite sure I followed him. I said so.

A little of his smile returned, and he shrugged. "I am sorry, Doctor. Did you not know? We are closing up. There will be no more clinic. My staff have all left. There is no one but me, and I will be going soon. What good is a clinic without patients?"

I understood. "As bad as all that, eh?"

"Oh, yes. They no longer trust me. They are uneducated peasants, these people—but they are *my* people. For twelve years I have been here—working, doing what I could for them, scrounging for funds when money ran short. The Government of India gave; the British gave; the Americans gave even more. I spent it wisely, I think. I have helped them. Do you know there are only two blind men in the village today? True. I helped them get rid of fleas, and the bubonic plague vanished. We have no cholera, no typhus, no typhoid—except when it is brought in from outside. Even then it is quickly isolated and it is cured when possible.

"I trained the midwives and taught them sanitation, so that children did not die of infections, of 'childbed fever'. I vaccinated them against smallpox.

"And then I taught them birth control."

There was a sudden bitterness in his voice. He swallowed a third of his drink as though it were one of the original gin-and-tonics.

"They trusted me, you see," he went on. "They took the pills. They regulated their families." He drank again, then put the glass, two-thirds empty, down upon the table top.

"And now," he said, "they have no more families. There has not been a woman pregnant here in four months. And they blame the pills. They know. Yes, they know. Vishnu the Creator had become Siva the Destroyer. As I was once the tool of Vishnu, so I have now become the tool of Siva. Do you have a cigarette, Dr Britton?"

He lighted the cigarette I gave him. "I worried at first. Now I find that it is world-wide. The newspapers are full of it. The villagers know, too. But they think that the pills have been dispensed everywhere and that it is the fault of the pills. So they no longer come to me when they are ill. They would literally rather die than come to me for help. Would you care for another drink?"

"I would. Thank you, Doctor," I said. I finished my own and handed him the glass. Then, before he could begin talking again, I said: "You have, I believe, been invited to the forthcoming meeting in London?"

He nodded. "Yes, yes. I must do something, of course. Though why they invited me, I cannot think." His smile came back as he looked at me. "Nor can I think why you are here, Dr Britton. I am honoured, but I am also confused."

I decided I might as well give it to him bluntly. "Frankly, I need your help, Dr Gokhale. We believe that there was one man who foresaw all this and tried to find the cause before it struck." He either did not notice or ignored my switch from the singular to the plural pronoun.

"One man?" His dark eyes widened. "Who?"

"Professor Edmond MacCrae."

"Professor MacCrae? But this is astonishing! How could he have foreseen such a development?"

I explained to him by giving him a carefully censored version of what Sir Martin had deduced.

When I had finished, Dr Gokhale said: "You would like to see my correspondence with him, then? Just a minute; I have it in my files."

He rose and went over to a rather battered-looking steel filing cabinet. He pulled out a drawer and began looking through folders. "Somewhere here now . . . ah! Yes. Here it is. His letters and the carbons of my replies. All complete. Satisfactory." He brought them to the table and handed them to me. "I don't think you'll find much there, though," he said rather sadly. "Mostly, we discussed influenza and immunization reactions. And scarlet fever. I was interested in scarlet fever, although we have very little of it in India. I have never seen a case of it myself. Professor MacCrae mentioned that it, like smallpox, gives immunization for life. You'll find it all in the letters, there. You go ahead and read. I will see to it that the supply of coolant does not fail."

I tried to ignore the fact that Dr Gangadhar Gokhale was a desperately unhappy man and plunged into the letters. There weren't many of them.

Gokhale had been right about the contents of the letters. Influenza was discussed. So were smallpox, virus vectors, Anglo-Indian politics, the mounting tension of the Cold War, and even an analysis of the cricket matches in Calcutta. But not a single word about human genetics or analysis of the human DNA helices.

When I finished the last letter, I carefully put the whole collection back in their folder and looked up at Dr Gokhale.

"Nothing?" he said, noticing my expression. "I didn't—"

It was at that moment that the piece of brick came smashing through the window.

There was no glass in the windows; they were shuttered with those slanted-lath affairs rather like a Venetian blind, which allow air to circulate while ensuring a modicum of privacy. But the brick was thrown hard enough to break two of the laths.

Someone outside shouted.

Dr Gokhale was on his feet, a shocked expression on his face.

There were more shouts.

I was on my feet, too, with my pistol in my hand. Through the break in the shutter, I could see a crowd outside. No, not a crowd—a mob. One could see in their faces the ugly, reasonless urge to destroy. They had evidently gathered silently until one of the bolder members threw the piece of brick. Now they were shouting. Another missile bounced against the shutter but did not penetrate.

"What are they saying?" I asked Gokhale in a whisper.

He looked at me. "They want the English dog who brought the pills which kill their manhood."

Somehow, a rumour had got started and had built up to this.

"Where the devil are you going?" My own voice sounded harsh in my ears as I grabbed his wrist with my free hand. He had been reaching for the door handle.

"I will talk to them. I will explain that—"

"Don't be an absolute idiot! Listen!" Stones were already striking the door. "Open that door, and you'll get brained! Those people are in no mood to listen to you."

For the first time, he saw the pistol in my hand. "Please don't use that," he said. "They are just ordinary people. They mean no harm. They are like frightened children."

"I don't intend using it unless I'm forced to. But those 'children' out there are big enough to be murderous."

Another piece of brick smashed through the window, and the mob outside roared. I have heard tigers roar in India, but this was more deadly by far. A single bullet will dispatch a tiger; it would take a hundred to break up that mob.

"They'll be coming in soon," I said. "Is there another way out?"

"Only the side door, and they would see us there."

"Let's go upstairs. I have an idea."

We were still going up the stairway when a torch came looping through the broken shutter and landed on the floor. There was no time to be wasted putting it out.

I had remembered that when I had parked my car behind the building I had seen no windows in the ground floor at the back, but there had been windows in the upper story.

I went to the window and peeped down between the laths of the shutter. There was no one in the rear courtyard as yet. Evidently the mob knew there were only two doors and hadn't yet thought of the upper-floor windows.

I pushed open the shutter. "Come on," I said. "We're getting out of here."

He didn't argue, though I had rather expected he would. I was prepared to carry him out unconscious if necessary.

Climbing out was easy enough, since my car was parked directly beneath the window, and there wasn't more than a ten-foot drop to the ground anyway. We were just climbing into the car when a turbaned head looked

round the far corner. I fired a single shot deliberately high, so that it hit the corner of the building just above the man's head. The bullet made a whanging noise and spattered dust. The head vanished.

I started the car, backed away from the wall, and headed it out the alleyway opposite from the side where the head had appeared. Nobody tried to stop us. Almost nobody even saw us. Within ten minutes, I was on the road toward Udaipur.

The doctor had remained silent all that time, but when we were finally on the open road, he made a slight noise. I didn't have to look at him to know what it was.

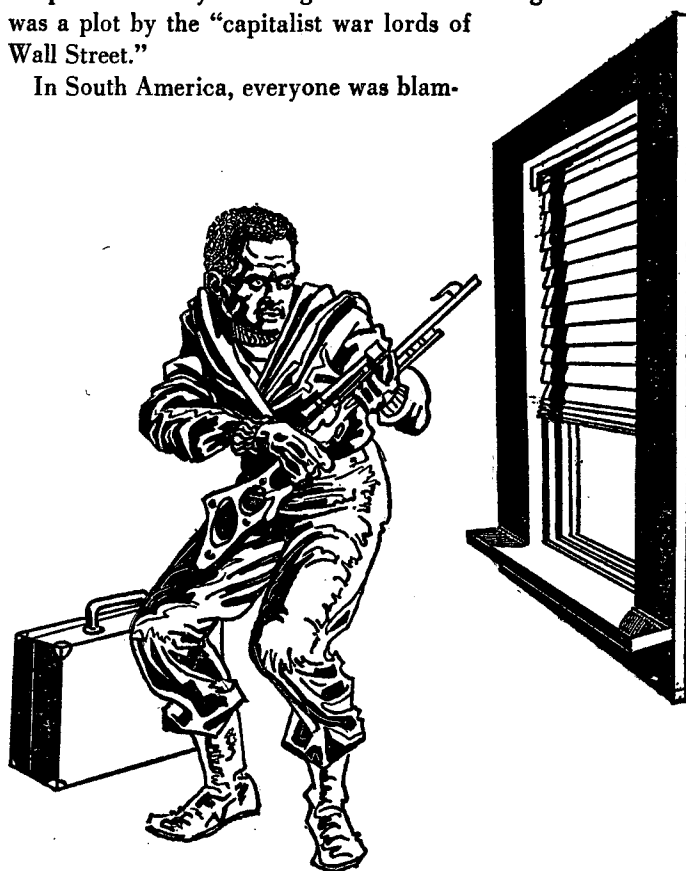
Dr Gangadhar Gokhale was crying.

By the time I had returned to London, I knew that Dr Gokhale and I had been very lucky indeed. Other mobs in other places had been more successful in their murderous intent. Birth-control centers all over India had been mobbed and destroyed. And not only in India, but in other places as well. There was rioting all over the world as one group or another was blamed for the disastrous drop in pregnancies.

In South Africa, the Negroes were blaming the whites, and a deadly shooting war had begun between the races, which, while effective in altering the death rate, had no effect on the birth rate. The blacks were waging a war of extermination, with no quarter given.

The Chinese peasants were blaming the Communist regime, while the Communist leaders tried to take the pressure off by claiming that the whole thing was a plot by the "capitalist war lords of Wall Street."

In South America, everyone was blam-



ing everyone else, and there were insurrections everywhere. Cuba and Ecuador were in revolt. There were riots in the capitals of Peru and Chile.

Only North America, Europe, Australia, New Zealand, and Russia remained fairly calm, although Poland, Hungary, and Czechoslovakia were on the point of rebellion. That, however, was due to politics, with the declining birth rate as merely an added factor.

The meeting of scientists came off as scheduled, but without any data from Edmond MacCrae. By mutual agreement of the governments concerned, the men who attended that meeting were allowed to go anywhere, at any time, without hindrance from anyone.

The immediate cause of the failure of the fertilization mechanism was soon discovered. It was an immunity reaction. The females of the species had become, as it were, deadly to the male. They reacted to the sperm as they would have to an invading bacterium to which they had become immune. But what had caused the immunity in the first place?

There were speculations of all kinds, the most convincing of which was a virus infection of some kind, but no one could point out any specific virus, nor had anyone any information on how the virus was vectored.

Every new pregnancy became the subject of much testing and discussion and investigation. And there still were a few new pregnancies. Berlin, in particular, seemed to produce more than its share, but there were some in Moscow, some in Washington, and some in London. And there was apparently a belt running down the centre of Africa where things went on as usual. A few islands in the Pacific seemed unaffected, and, acting on the virus theory, Tahiti and a few others closed their ports to all shipping.

Then a new factor entered into the deadly equation. A meeting of immunologists in Paris was suddenly broken up by a bomb explosion which killed two of them and seriously injured four others. In London, a geneticist was stabbed to death one evening while walking home from St Bartholomew's. Some group was gunning for the very men who carried the hope of the human race in their brains.

Meanwhile, the investigation of Professor MacCrae's work had reached a dead end and faded into unimportance. As a last-ditch try, Sir Martin sent me to America at my own request. "Very well, Britton," he said, "if you think you might get some information from the American psychiatrist, go ahead. There might, as you say, be some chance of MacCrae's having said something in his madness that would give us some clue. But I'm not banking on it."

As a scientist, I managed to get a reservation on a special flight that was leaving London for New York, carrying only men who were associated with the research project. Because of the fear that a bomb might be planted on planes carrying scientists, these special flights were thoroughly checked and re-checked.

There was no bomb on the one I took, but the moment he stepped out of the aircraft, Dr Vladimir Karsov got a bullet through his heart.

Twenty minutes later, all the passengers and the crew of that flight were in a room at the airfield, waiting for the FBI. One of the Russians who had been with Karsov tapped me on the shoulder. "Could I speak with you a moment?"

I'd been afraid that would happen. I nodded, and we walked casually away from the rest of the crowd.

"I know you, I believe, Mr Britton," the Russian said. He had his cigarette case out and was offering me one. I took it.

"I know you, too, Mr. Vishnevski," I said. "Light?" I held my lighter flame for him.

"Such are the failures of Security," he said with a sigh. "We secret agents don't last very long, do we?"

"Not as secrets, no."

"This time, however, we are both on the same side," Vishnevski said. "In times like these, one ceases to think of oneself as a Russian, or an Englishman, or even as a Communist, or a Capitalist. One thinks of oneself only as a human being."

"Somebody doesn't think that way," I said. "The somebody who shot Dr Karsov."

His eyes narrowed. "That is what I wanted to speak to you about. You saw me talking to the American police officer?"

"Yes."

"He has informed me that the assassin was caught. They found him with a rifle—a folding type—in a suitcase. He swallowed poison and killed himself before they could stop him. Cyanide. Very dependable."

"So?"

"I went to take a look at him. Naturally, I said nothing to the police officer, but I will identify him to the FBI. And to you. He was once a member of the Retribution Society."

I gave him a sardonic grin. "The Retribution Society does not exist."

"True," he said with a calm smile. "As a matter of strict fact, it no longer does. Certainly you can believe that this man was no longer acting in that capacity."

"You have a point there. Do you know what *was* his purpose?"

"The man was a Negro. You are aware that this disease, this disaster, has apparently failed to strike in a wide belt running down the centre of Africa?"

I was beginning to understand. "Yes," I said.

"Well, a small group of fanatic racists among the Negroes do not want the birth problem solved. If it is not, the whites will die, and the blacks will inherit the Earth. Mad thinking, but all fanatics are mad."

"Do you think they can be tracked down?"

"I think so, now that we know something about them. I hardly think that they have the backing that the old

Retribution Society had. They should be easy to trace."

"Do you want help?"

"Not at the moment. With our information, the FBI can take care of the situation here in America. I have informed you so that you can inform your superiors— whoever they may be. I take it that you do not particularly wish to become involved with the FBI at the moment?"

"I'd rather not. I'm just a virologist working with my colleagues now."

He smiled. "And that is why you carry a pistol beneath your left armpit? But don't worry. I will say nothing to the FBI."

He strolled away, as though we had been talking about inconsequential.

It was another half hour before we were released.

I did not manage to get to the sanitarium where Professor MacCrae was staying for two days. I wanted to make sure that neither the FBI nor the Russians connected me with the professor in any way, and that took rather a lot of misdirection on my part.

Getting to see Dr George Burton without giving my real name to members of his staff took a bit of doing, but I got into his office at last.

He was a lean, wiry man with a balding head and keen eyes that were partially hidden behind black-rimmed glasses. "How can I help you, Dr Featherstone?" he asked pleasantly. I had passed myself off as a visiting psychiatrist.

I smiled back and took an envelope from my pocket. It contained a typescript that I had worked very hard on. "I just want you to deliver this to one of your patients." I handed it to him.

His smile was replaced by a frown when he saw the name on the envelope. "Surely you realize, Dr. Featherstone," he said, "that Professor MacCrae is in no condition to read a letter. His mental condition is such that—"

I interrupted him. "His mental condition is such that, with your help, he was able to pull the wool over the eyes of some of the best psychiatrists in England. Just deliver the letter, Doctor, and let Professor MacCrae make up his own mind, will you?"

Burton didn't look the least taken aback. "I haven't the foggiest notion of what you mean by that, Doctor. However, if you want, I'll be happy to take him the letter. Just don't be surprised if he ignores it completely."

"I'll wait," I said.

"Very well." He left the room with the envelope.

He didn't return for fifteen minutes. When he did, there was the faintest touch of paleness about his face.

"Come this way, if you will, Doctor," he said. I followed him down a corridor, through several doors which had to be unlocked and relocked again, until we came at last to a door that led into a private room. Far from being a padded cell, it looked like a room in an expensive flat.

Standing in the middle of the room was a stocky, smiling man with bushy hair. He held my typescript in his



hand.

"Congratulations, Dr Britton!" he said immediately he saw me. "You have missed many of the details, but this is minor. How did you know? Have I left that broad a trail?"

"I don't think so, Professor. And I'm almost certain no one else is tracing you. You made one minor mistake that set me onto you."

"What was that? Sit down, sit down. You, too, George. They can only hang us once."

"Dr Burton knows everything?" I asked.

"Everything. You can talk freely. What was my mistake?"

"You were too honest. When you set the time mechanism—whatever it was—that burnt your laboratory down, you were too honest to take insurance money for arson. So you let your policy lapse. But a man who kept records as you did, a man who knew to the gramme how much of what kind of reagents he had, who was able to make a small fortune on the stock market, would never have forgotten to pay his insurance premiums. Naturally, you had to make it appear that your notes had been burnt, but being honest you wanted no one to be cheated by the fire."

"I hadn't thought of that," MacCrae said rather sheepishly. "What else?"

"Well, there was your acting ability. Nobody questioned your MacCrae identity. You even had young Medson convinced that you were a Scottish Presbyterian, which is pretty good for a man who was brought up in the Russian Orthodox Church—or at least influenced by it."

"But what did that tell you?" he asked.

"It told me that you could easily play the part of a catatonic psychotic — with a little coaching from Dr. Burton, so that you would display the correct symptoms. But even Sir Egbert Langsdale, while he did not question your actual madness, thought it odd that a man of your character should go dotty just because his house burnt down."

"I see. But" — he tapped the typescript — "how on Earth did you learn all this?"

"Deduction and accurate guesswork, mostly. As a virus man myself, I had my suspicions about the method, once I got it through my head that you were responsible for it. At first, I thought you might have deliberately infected the people from whom you were taking those samples that you actually had no use for. But you were too smart for that. As I said there, I think that the virus is water vectored. Slow-dissolving capsules dropped into water supplies, I imagine. And after that the contagion was from person to person."

"That's right," he said. "I was afraid that otherwise the path of the disease might be traced, and if it was found to follow my route exactly it would lead directly to me. But the capsules dissolved at different rates, so that the timing was completely different."

"The point that bothered me from the first was motive," I told him. "I couldn't bring myself to believe that anyone but a madman would want to wipe out the human race, and I couldn't believe that a man with Dr. Burton's reputation would shield a madman. Not *that* kind of madman. In fact, it wasn't until I saw the pattern of the new pregnancies that I realized what you had done."

"Do you think the others will see it in time?" he asked.

"I think so. It's pretty obvious once you look. If they don't, I'll drop a subtle hint or two. But I think the others will see that there is something odd about those pregnancies. Why should only wives of diplomats just returned from overseas be able to conceive? And why that strip running down Africa? And the extraordinary number of new pregnancies in Berlin? Obviously people from a given area are *not* immune to people from another area!"

He nodded. "It was a desperate move on my part, but I knew the problem had to be solved soon or we would all die in another way. International relations were strained to the breaking point. Atomic war would have

come soon, and few of us would have survived that. The solution came in the form of synthetic viruses. You may see my notes later, if you like, but the basic notion is simple enough.

"I deliberately synthesized a relatively simple and relatively harmless virus. It matches, in certain ways, the genetic material of *Homo sapiens*; I didn't want other animals getting infected by it. Only Man is not immune to this virus. However, the virus itself is not dangerous. It could never have developed naturally because even the immunity reaction of a human being comes into play very quickly and very strongly, destroying the virus in a matter of a day or two. Once immune, the immunization is permanent.

"But, as far as reproduction is concerned, the immune person is also immune to anyone else who has been infected with the same virus. It spreads quickly and causes no discomfort other than a slight case of the sniffles, utterly unnoticeable and impossible to tell from the common cold, except that it is much milder.

"I synthesized two slightly differing forms of the virus — I called them A and B, which I think is simple enough." He chuckled. "Virus A," he continued, "also causes immunity to Virus B. If you've caught the one, you can't catch the other. And B, of course, immunizes you to A. But the cross-immunization does not extend to the reproduction process. A man and a woman who have both had Virus A cannot have children together, nor can a couple who have both had Virus B. But if one has had A and the other B fertilization takes place in the normal manner.

"I planted Virus A in North America and in Europe as far east as the Iron Curtain. Behind the Iron Curtain, I planted Virus B. Africa is approximately split down the middle, which is why you find pregnancies occurring in the area where the two overlap. In Europe, the Iron Curtain effectively separated the two populations except in places like Berlin. And, naturally enough, a diplomat who caught Virus A in Washington or London and

N.E.W.S. QUESTIONS

Which state of the United States extends farthest to the North? East? West? South?

*And if you get all four of those simple items correct you rate Professional Geographer.
If you aren't sure (and even if you are!)
better check first on page 80 and then get out the map.*

then went home to his wife in Moscow, who had caught Virus B, would be able to impregnate her.

"Of course, I couldn't reach every place on Earth. That's why the Pacific islands remained safe. But they hardly constitute a threat of atomic war, anyway."

"What about the viruses themselves?" I asked. "Won't they remain endemic?"

"No. Unless they're in a special solution, such as I had in the capsules, they can't last forty-eight hours outside the human body. Inside it, they last only long enough to trigger the immunization reaction. It must be contracted from someone else between the time they were infected and the time they become immune. By now, I doubt that there is a single virus left. Those who are immune can't carry it, and those who are not immune haven't got it to carry."

"Is there no cure for it, for the immunization, I mean?"

"I imagine one could be found," he admitted, "but it would be difficult and it would take too long. I'm certain that no one will bother to spend twenty-five years discovering a cure that will be of no use within a generation. Not when there is a much simpler solution right in hand."

"People are not going to like that solution at first," I said.

"My dear Dr Britton," he said with a smile, "the urge to reproduce is much stronger in human beings than political affiliations. The Iron Curtain must fall. International barriers will go down. People will move because they must. There is no way out. The thing has been done, and the only way for the race to survive is to allow the populations to mix."

He spread his hands. "That is why I do not mind so much that you have found me. I tried to cover up, but I failed. Well, I am willing to accept that. As I told Dr Burton, I can only hang once. But my death would not change anything."

"I know," I said. "And that's why I'm not going to report you. In a way, I suppose, you're guilty of murder—many have died by mob violence. Perhaps they might accuse you of attempted genocide. But not nearly as many have died as would have died in an atomic war, and that, it seems to me, justifies your actions. No, I'm not going to report anything except that I could get no information from Dr Burton, here. Which is quite true, but quite misleading. I would like to look at your notes some time, though."

"Now, if you like," said the professor.

"No, not just now. I have another job of tracing to do." I stood up and extended my hand.

He took it and shook it warmly. "Someone else was on your list of suspects?" he asked.

"No, this is rather a different job of work. I'll have to leave now. Will you take me out, Dr Burton?"

"Certainly."

We left Professor MacCrae to his studies, and Dr Burton led me again through the series of locked doors. As he unlocked the last, he said, "It seems to me you took a chance in coming here. Weren't you afraid we'd ... or ... dispose of you?"

"No. Neither of you is a desperate criminal, and both of you were and are ready to take whatever consequences may come. You are both willing to be responsible for what you have done. You wouldn't commit murder to escape those consequences."

"Thank you," he said quietly.

He saw me to the front door of the sanatorium. "I hope your next tracing job is as successful as this one was," he said.

"I do, too. I'm looking for a very pretty girl I once knew in Moscow. Good-by, Doctor."

I walked down the concrete steps toward my waiting car. ■

ANSWERS to the N.E.W.S. Questions on Page 78

You'll have more fun with this if you try the questions first, without reading the answers! The reason you probably got the wrong answers (practically nobody gets all four right!) is that you forgot one, or both, of two important items. First, that there are fifty, not forty-eight states in the United States, and second that only one of the fifty crosses the International Date Line, which is, by definition, both the farthest east, and the farthest west you can go. Therefore, the answers are, in order, Alaska, Alaska, Alaska and Hawaii. The average score for well-informed people seems to be one right; if they remember there are fifty states, they'll usually get Alaska as the northernmost, but pick Texas or Florida as southernmost, Maine as easternmost, and California as westernmost—and that despite remembering there are fifty states!

search conference in New York in May, explaining lunar seas and craters, rilles and highlands in terms of active volcanic shaping in the past. They went so far as to assign a volcanic origin to the Wolf Creek crater (Australia), the New Quebec crater (Canada), and even the Meteor or Barringer crater (Flagstaff, Arizona)—show pieces of the impact theorists, for whom Flagstaff has become a veritable plague spot. One geologist asserted that all ten possible meteoritic craters discovered in Canada must be volcanic.

Carlton Beals, Dominion astronomer of Ottawa, had perhaps the final word on this particular phase of the controversy: "The universe is rather large and varied and it has plenty of room for more than one type of physical process," he said. "Neither impact nor volcanic theories will win out in the long run. We all need to collaborate on reaching criteria that will distinguish more sharply and reliably between both terrestrial and lunar volcanic and impact craters." Beals' suggestion makes excellent sense to many lunar scientists who are quite sure, for example, that Copernicus is basically a great meteor-impact crater but that many smaller craters even in its neighborhood are volcanic in origin.

Patrick Moore pointed out that "the number of lunar activities reported seems to vary directly with the total amount of time devoted to observation of the moon." He stressed that "further studies are needed before any final conclusion can be reached," and recommended that "a world-wide observational program be initiated at once to keep at least the lunar areas where activity is suspected under constant surveillance."

On this score, James Edson, associate administrator of the National Aeronautics and Space Administration, announced in May the development of a "color-blink" instrument to aid in



Royal Canadian Air Force

Clearwater Lake craters (20- and 14-mile diameters) in Canada, which have been tentatively identified as meteor craters created hundreds of millions of years ago.

the discovery of color phenomena or surface brightenings on the moon. Sponsored by the National Aeronautics and Space Administration, it would reveal color changes by adapting the principle of the blink microscope. The blink microscope, which identifies variations in the intensity or movement of light, played a role in the discovery of the planet Pluto.

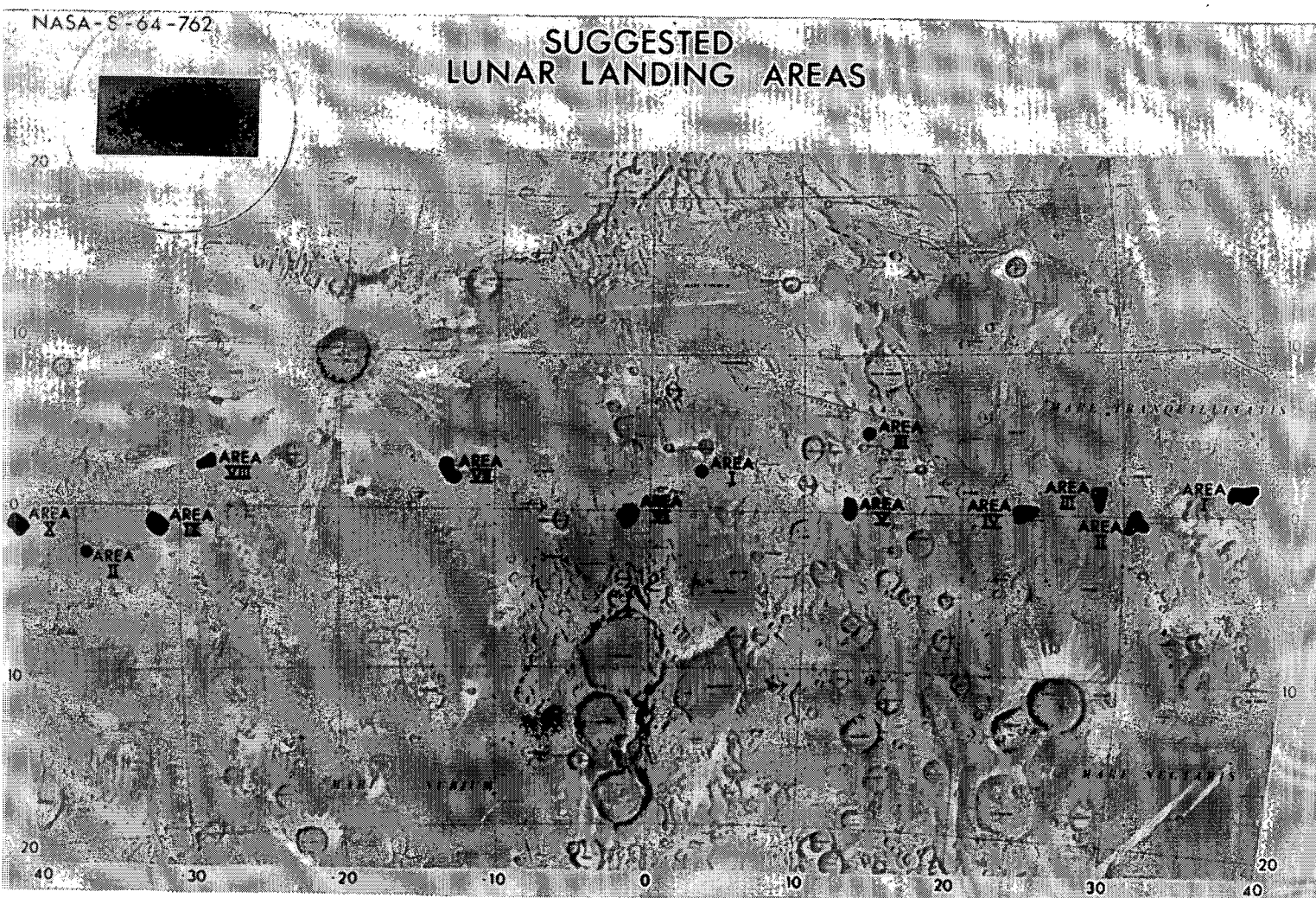
Any color phenomena occurring on the moon would be amplified in and appear to pop in and out of the telescopic image in the "color-blink" instrument, just as in the blink microscope the photographic image appears and disappears, seeming to "blink." The most complex model will use a color television system to compare two or more telescopic images of the moon

automatically, identifying those on which even minute color phenomena have occurred.

Such instruments, only now being designed and developed, would have their limits, of course. The color phenomena that appeared near Aristarchus were not easy to resolve because of the relatively small areas covered by the patches. Greenacre judges that a 16-inch reflector or a 20-inch refractor might be needed to pick out such tiny colored spots as those he saw, since he was not able to detect them in the 12-inch guide telescope at Lowell Observatory. Moore estimates that color phenomena or brightenings like these might be observable with a good 12-inch telescope. Very few amateurs are lucky enough to own instruments as

large as twelve inches in aperture. The extent to which the "color-blink" instruments would intensify the color images would also determine how large a telescope had to be used. And instruments of this kind certainly cannot substitute for a constant organized surveillance of these active areas by sizable telescopes across the country, or on an international scale, around the world.

Volcanists suggest that tidal disturbances in the lunar crust may be caused by the gravitational pulling and hauling of the earth. Such tides might bring about the volcanic activities on the moon that they believe cause the "color phenomena" like those around Aristarchus. The nights of June 4 to 6, 1964, offered a first test for this theory,



Lunar landing areas suggested for the Apollo program (north toward top).

Manned Spacecraft Center, National Aeronautics and Space Administration

because the effects of the earth's gravity on the lunar crust were the same as they were on October 29, 1963. Unfortunately, the sky was so overcast at Flagstaff, Arizona, on these nights that the moon could not be followed there.

The Amateur Astronomers Association of New York announced, however, that on the night of June 6th dim spots were seen by several amateur observers using an 8-inch reflector at Riverdale in The Bronx, New York. This time two tiny red or reddish-brown specks or smudges were reported between Aristarchus and the nearby crater Herodotus, south of Schröter's Valley. They were seen simply as colored spots, without the sparkle or motion which had been remarked at Lowell Observatory in 1963, and were difficult to pick out. This observation was perhaps more in keeping with an interpretation of the spots as luminescent phenomena occurring when the sun was rising on the region than as some kind of volcanic activity. But very little detail could be distinguished by such a small telescope, and the observation only tends to confirm the existence of color phenomena in the vicinity of Aristarchus, not to indicate either their nature or their cause.

What bearing do the effects in Aristarchus and Alphonsus have on our space programs? The exact limits of the area within which men on the first Apollo excursion are to land on the moon have not been announced. Orbital and propulsive requirements were probably decisive in the choice. It is general knowledge, however, that this area is along the lunar equator, perhaps only a few degrees wide to the north and south of it, and stretching perhaps thirty to forty degrees east and west of the moon's central point, located in the Sinus Medii.

As it happens, almost no lunar activities have been reported in this suggested lunar landing area. Although it is on the border, if not well beyond the proposed landing belt, the Hyginus cleft system, which passes through the crater of Hyginus, located about eight degrees north of the lunar equator, has been found to consist principally

of a row of tiny craters and has shown signs of activity. Here, H. P. Wilkins reported that at times white spots appear on the edges of the clefts and at other times a haze or mist seems to obscure the clefts. In reviewing the evidence, Patrick Moore admits that in the Hyginus area "there is a chance that once more we are dealing with occasional 'veiling,'" but he concludes that "personally I have grave doubts."

In addition, in 1878, Hermann Klein, director of the Cologne Observatory in Germany, reported an apparent remarkable change in the lunar landscape northeast of the Hyginus crater. This was a new, small crater, apparently without a pronounced rim or wall—little more than a depression. A search through earlier maps, drawings, and photographs failed to turn up a record of this depression, later named Hyginus N. Additional study of the area revealed another apparently new, still smaller depression to the southwest, connected with N by a dark band; this was called Hyginus N₁.

While Klein's contemporaries tended to accept these craters as new phenomena, it is generally thought now that they had simply been missed by the earlier observers and mappers. Just east of N there is a mountain ridge that throws a shadow and thus makes N and N₁ stand out more sharply at sunrise on the moon, giving them the appearance of full-fledged craters. This circumstance is believed responsible for Klein's seeing these craters; his predecessors may not have viewed them under just the right conditions of illumination. Many other supposed changes on the moon may well have been due to similar effects. But the white spots and obscurations in the cleft cannot be explained away in this manner. Hyginus may be an area worth close investigation.

Our lunar exploration plans may have to be changed if, as the Flagstaff color phenomena and other observations suggest, certain regions of the moon eventually are proved to be the scene of volcanic activity. Jack Greene, of the North American Aviation Space Science Laboratory, holds that if most

lunar craters and maria are the effect of volcanic activities, then "base selection should be guided by a different set of objectives than if the lunar surface were dominantly impacted." He points out that volcanic terrain offers many tubes, caves, and fissures to provide protection from solar radiation and temperature extremes, as well as mineralization, such as ice or sulfur, and sources for heat, which would not be likely in impacted environments. One of the lunar craters he suggests for a base is Alphonsus, far south of the landing ribbon proposed for the Apollo excursion. We could scarcely afford to bypass areas that contain such assets. The Russians, who have stuck to the volcanic hypothesis and made extensive geological studies of the lunar surface, may be far better prepared than we are to take advantage of this kind of situation.

Fortunately, most of our lunar scientists now seem agreed that there is a pressing need to accumulate and integrate all possible facts about the moon's surface features. Participants in the New York conference on geological problems in lunar research held in May were circularized after the event to determine whether they would "urge that lunar research be pursued on as broad a basis as possible. This research should include studies of laboratory models and terrestrial analogs of such features as nuclear explosion craters, meteor impact craters, volcanic and crypto-explosion craters, calderas, volcano-tectonic depressions, cauldron subsidence structures, and associated tectonic patterns"; in other words, many types of both impact and volcanic phenomena should be investigated.

While the returns from this survey are not yet in, such an open-minded, objective, and co-operative approach, free of the bickering over theory that has hampered lunar research in the past, should hasten the day when the nature of the forces that have molded the moon's surface will be unequivocally established. ■

the liquid world

continued from page 6

However, the use of the term "cruise" for the *Trieste's* activities is somewhat over-optimistic; a healthy ten-month-old baby can crawl about as fast and about as far as the *Trieste* could maneuver—at 8,500 feet, 35,000, or at 3.5 feet. Weeks were spent getting the ungainly device to the scene, and servicing it at the scene, for a few score hours of extremely limited observation at the sea floor.

That the *Thresher* had been ruptured and destroyed there was no doubt; various bits of certainly-identified debris were recovered. Scraps of plumbing—plastic overshoes—various bits and pieces were found lying on the muddy bottom. But despite weeks of effort, the immense pressure-hull of the *Thresher* was not located. There's no doubt it's there all right—an immensely massive, tremendously strong steel tube, hundreds of feet long and scores of feet in diameter.

But even with *Trieste's* "low-pressure, wide-angle viewport" in place, the area of view from the bathyscaph is somewhat narrower than that available through the average old-fashioned keyhole. The viewport consists of a truncated cone of transparent acrylic plastic, the small, truncated end inward, resting in a conical hole in the thick stainless-steel shell of the bathyscaph's cabin. A light steel rim keeps it from falling out when the bathyscaph is lifted from the water; a film of grease helps to seal its conical surface to that of the steel—and the water pressure holds it in place.

Very neat, very simple, beautifully watertight . . . but very limiting in the matter of field of view.

And the *Trieste* is the only research probe Man has yet developed that can get a look at something like one-third of the area of the planet we live on. Our maps of the Moon are enormously superior—we have accurate, detailed maps of nearly two-thirds of Luna.

The *Trieste*, exploring the bottom of the Atlantic for the remains of the *Thresher*, or the bottom of the Pacific

Trench is about in the position of a man trying to map the Rocky Mountains under the handicap that he can work only on foggy, moonless nights using a penlite flashlight for illumination. Add that the flashlight is fastened on his head, he has two broken arms, and a sprained ankle, which make manipulation practically impossible, and limits him to a slow, hobbling progress, which he can maintain for only a short distance.

The exploration of the sea bottoms is not easy, nor very rapid.

The seas are far more mysterious than we have appreciated; as is more or less standard, the more you know about something, the more you realize the extent of your ignorance. One of the most startling things is that so far as has been determined to date, the oceans did not exist more than about 200,000,000 years ago. There were, of course, shallow seas and inland lakes—but the immense ocean depths we know simply don't seem to have been present.

This makes understanding the nature of the processes of evolution of life somewhat more confusing. Also, it makes the problems of geology take a new slant.

But take something simple and fundamental—an easily and directly measurable thing: At a temperature of 4°C., how many milliliters of oxygen will one liter of sea water dissolve? This is, obviously an extremely important and basic datum in understanding the life cycles of the sea, and the interaction of atmosphere and hydrosphere.

Simple and directly measurable, eh? Hah! In some thirty years of intense effort, the answer hasn't been satisfactorily determined yet.

Sea water is *not* a solution of sodium chloride, with some magnesium and other salts in water. It's got all sorts of organic residues in it—and the ability of organic components to lock-up molecules of oxygen is fantastic, and exceedingly variable. Pass sea water through a microscope filter, to eliminate even the viruses, so there's nothing living in it and you'll find a variety of amino acids, purines, hydrocarbons, and assorted organic residues

in solution. Sure—they're present only in parts-per-million concentration, or they'd have been consumed by some organism looking for a free meal. But consider for a moment what one-tenth part per million means when you're dealing with part of an ocean—say about five million cubic miles of water. That "negligible" fraction works out to a half a cubic mile of matter. And when you're dealing with a dissolved gas . . . well, sea water dissolves approximately five milliliters of oxygen per liter of water. Experts in the field of chemical oceanography say that present methods of determining oxygen solubility in sea water may be in error by five per cent. In our five million cubic mile fraction of a sea, the error would be a mere 125 cubic miles of oxygen.

Accuracy in this work isn't easy; doing accurate chemical analysis aboard ship introduces certain difficulties not encountered in laboratories on shore. Precipitates don't settle well, just for a simple example; chemistry gets seasick, too!

Then there are accumulated and honored authoritative errors that throw things into confusion. For many years, the standard gadget for collecting samples of water from down deep was a brass container; lowered on a steel wire, and triggered to open, gulp a sample of water, and close again, the time-honored Nansen bottles.

As laboratory and industrial chemistry has advanced, men have learned to work at higher and higher pressures; the so-familiar cheap polyethylene plastic gets put together under pressures in the order of 50,000 pounds per square inch, for instance. Pressures two to four times that high are used in laboratory work. In the process they've learned things they never knew before—such as the unfortunate fact that, at deep-sea pressures, oxygen reacts with brass quite rapidly. The old readings on deep-sea oxygen content are, therefore, pretty useless . . .

Then there's the little difficulty of unsuspected misbehavior of the standard laboratory reagents. During the recent International Geophysical Year,

reports of oxygen content ran a few per cent higher from a British research vessel than from an American vessel covering nearly the same zones. Investigation disclosed that the British were using potassium hydrogen iodate as a standard reagent, while the Americans used potassium dichromate as a standard—and that the potassium dichromate had a slight tendency to react in a secondary manner, throwing the results off.

This interesting discovery now means that a lot of earlier reports are open to question. Which method was used on which analyses . . . and how much of the secondary reaction had interfered?

In dealing with oceanography, chemistry is working on its most extended limits; parts-per-million are the norm, not the exception. And even in analyzing for something like sodium chloride—present to the extent of about thirty grams per liter—parts per million are critically important, because the salinity of sea water determines its density, at a given temperature and pressure. And that determines whether it's heavier-than-normal water and due to sink toward the bottom, or lighter-than-normal and due to rise.

The Mediterranean Sea has an enormous evaporative surface, and relatively little run-off from the surrounding lands; it draws astronomic tonnages of surface water from the Atlantic to make up the difference . . . and to replace the almost equally astronomic tonnages of extra-saline water that flows out of the immense "evaporation dish" into the Atlantic at a depth of about 1,500 feet.

It takes only a few parts per million to have critical effects on the life cycles of the sea, of course—and some of those parts-per-million seem very strange indeed.

For instance, in the crustal rocks of the Earth, the ninth most common element—after oxygen, silicon, carbon, aluminum, iron, calcium, magnesium and sodium—is one almost no one but professional chemists heard of thirty years ago. It's enormously abundant, chemically related to carbon, silicon, germanium, lead and tin, a metal—and

quite unfamiliar to people even today.

Its abundance in Earth's rocks is about 8,000 parts per million, compared to about 80,000 for aluminum and 60,000 for iron. Cobalt, with an abundance of only 28 parts per million is absolutely vital to life processes—as vitamin B-12. Phosphorous, at 960 parts per million, is the life-quantity-limiting element; all known living entities are absolutely dependent on adenosine triphosphate for their biochemical energy transfers.

Yet titanium, ninth most common element in the rocks, is not used in any biochemical process by any known living organism!

Technologically, titanium was effectively unknown until the last few decades—yet tin, present in the rocks in only 1.5 parts per million, has been known and used from ancient times. Antimony, at 0.2 parts per million, was used for plating in ancient Egypt. Mercury, at 0.07 p.p.m., is almost as anciently known.

Titanium is, indeed, the "wonder metal"; I wonder why it wasn't used?!

Part of the answer lies in the effect of sea water on element distribution. Chlorine is present in the crustal rocks only at a concentration of 95 p.p.m.—but in the oceans, chlorine is third most common element, following only hydrogen and oxygen! It's 19,000 parts per million in sea water. It's not surprising that all living organisms use sodium and chlorine in their metabolism!

But titanium, 8,000 p.p.m. in the crustal rocks, is, by reason of the extremely low solubility of TiO_2 , present only to 0.001 p.p.m. in sea water. It's a Group IV element, of medium atomic weight and atomic number, and its electron shells are quite stable—it doesn't partake of subtle reactions. Cobalt, enormously less abundant than titanium in the rocks, is about half as abundant as Ti in sea water, because of the solubility of most cobalt salts—and cobalt, as one of the iron-nickel-cobalt triad of transition elements, *does* display extremely subtle and complex electron-ring transfers—which made it useful to life-processes.

Men have not yet learned to harness

more than the most gross and obvious biochemical systems—aside from the food plants and animals, we have done almost nothing in the way of applying biochemical processes to industrial applications. In sea water, uranium is half again as plentiful as vanadium; there are a number of marine organisms that selectively extract vanadium from sea water—at two parts per billion!—and use a vanadium porphyrin compound as an oxygen-transport mechanism in their blood. With uranium half again as plentiful . . . wonder what a little selective mutation and culturing could do . . . ?

So far, men are technologically extracting from sea water only sodium, chlorine, magnesium, bromine and potassium. Iodine is procured from sea water via an intermediate biological step, thanks to the fact that many sea plants concentrate iodine, and their ashes yield technically-recoverable concentrations. Of these, only iodine constitutes less than 50 p.p.m. in sea water.

Recently, some steps are being made toward mining the sea bottoms, taking advantage of some of the true sea-water-reaction mechanisms. Manganese nodules, for instance, are found lying on immense areas of the sea bottoms; tentative steps toward scooping them up and using them are beginning. Manganese is about 950 p.p.m. in the crustal rocks, and only 0.002 p.p.m. in sea water, because of the extreme insolubility of manganese-iron complexes formed in the presence of organic initiators in sea water. Both MnO_2 and ferric hydroxide-ferric oxide are extremely insoluble—but both iron and manganese form readily soluble salts in the presence of organic acids such as occur in the normal ground-water on land. The result is that quantities of Mn and Fe are transported to the sea . . . and are promptly recombined in true sea-water reactions to produce the manganese-iron nodules on the sea floor.

These things oceanography has begun to learn about the oceans of Earth are very, very crude beginnings indeed. Undoubtedly most of what we "know" now will turn out to be mis-

taken, misinterpreted, or downright wrong, when we get better data. It was not very long ago that everybody "knew" that water was incompressible; now they're making studies of how various degrees of salinity affect the compressibility-factor of water. We're only beginning to recognize the importance of pressure on chemistry and chemical balances. The deep oceans have almost perfectly constant temperature—4°C., because that's the temperature at which water reaches its maximum density—and the oceans are patient; if a reaction-system takes 100,000 years to reach equilibrium . . . why, wait a few megayears and see what happens!

Finally, a note for future interstellar astronauts:

Not all stars have the same element-composition that Sol does. Astrophysicists used to believe that the differences of stellar spectra were due simply to different temperature conditions. But more recently, they've been discovering that that's not the case.

Standard model stellar hydrogen-fusion pressure-cookers—the cores of main-sequence stars—can cook up any of the elements from carbon through iron from fusion of hydrogen and helium. There will be a little overshoot, producing a little of the elements slightly heavier than iron. But standard-model stars, after fusing nuclei into those carbon-to-iron elements, tend to keep the results firmly locked inside a very deep gravitational field.

It's when an over-loaded pressure-cooker blows its top that the heavier elements get out into the stellar gas-dust clouds—when an over-size star goes supernova and explodes.

During the explosion, nuclear reactions totally unlike those of the normal fusion reactions take place. Uranium is definitely not going to form in any ordinary main-sequence stellar core; uranium yields energy by *fissioning*—not by fusion! In effect, uranium could be forced to fuse only by having medium-weight nuclei—the fission prod-

ucts—in conditions of such stupendous pressure and violence that the fission reaction of an atomic bomb would be forced to run in reverse! Imagine conditions so violent that a detonating fission bomb *imploded* back to U-235!

The debris exploded out into space by an exploding star is *not* an equilibrium phenomenon; it was produced by an appalling violence, in an appallingly short time. (Some calculations suggest that a star ten to one hundred times as massive as our Sun would undergo the supernova explosion-implosion catastrophe in about one hundred *seconds*. Remember that while it takes minutes for the development of the mushroom cloud of an atomic bomb explosion, the nuclear reaction was all over by the end of the first few microseconds; in a similar way, the supernova explodes into brilliance in a day or so, and shines with immense brilliance for a year or more—but the actual reaction took only one hundred seconds.)

Because the reactions occur with such speed, equilibrium conditions don't have time to become established. A radioactive nucleus with a half-life of only one second will, from the viewpoint of a supernova explosion timescale, represent a "stable" isotope. It lingers around long enough to be bombarded by a dozen additional protons and neutrons before it has a chance to disintegrate . . . and becomes some entirely different isotope in the process. When an astrophysicist talks about shock-waves in a supernova explosion, he's talking about shock-waves with energy density so violent that *nuclear* structures are shattered.

The overall result is that the products of a supernova explosion aren't very predictable; statistics would apply perfectly, of course . . . if they had time to set in! Statistical methods work, when the sample is large enough; in this case, the time-duration sample is not large enough, and not even statistical methods are entirely reliable.

So a particular supernova may explode in such manner as to load circumambient space for a few dozen light-years with an abnormally high

percentage of molybdenum or an outrageous percentage of platinum. Or we might find a planet of a sun that had, by some strange freak of preceding supernova explosion, 200 copper atoms per million silicon atoms, but perhaps 10,000. E. E. Smith's copper-bearing planets of the "Skylark" series, in other words, can't be declared impossible!

And the effect such odd compositions have on suns is equally an unknown—because it's definitely known that some species of nuclei have some kind of catalytic effect on a normal main-sequence fusion core. They can cause unusual thermonuclear effects.

And, of course, we really know very little of the actual dynamics of stellar interiors.

But this we do know: since nuclear reactors have been at work, we have been able to produce all the possible combinations of neutrons and protons that represent all the possible nuclear isotopes. (Possible in the sense of having half-lives of more than a few seconds; what a supernova explosion can produce is something else again.) We now have the spectra of *all* the possible elements up to about 100—including those that had no stable isotopes, and were, therefore, missing from Earth long before Man came along, if they ever did exist. Technitium — Promethium — Francium — and those transuranic elements such as Plutonium and Curium.

We know that technitium has no stable isotope, and that the longest-lived isotope has a half-life of the order of one million years.

There is no technitium in the Sun—at least, not at any level where it can affect the solar spectrum.

But stars are known which show massive concentrations of technitium in their spectra; clearly, they're cooking with a different kind of gas than our sun uses.

Wonder what kind of soup we'll find, some day, in the oceans of planets of those different suns? The elements may be the same . . . but will their interactions, in the immensely complex reaction-system we call "sea water"?

The Editor.

SOVIET SCIENCE FICTION—II

Not so many years ago, when Russia was still in its Stalinist era, we were told repeatedly that the Soviet regime was issuing diatribes against science fiction. With the current cool-off, we Westerners were surprised to find that Russians had been writing and publishing science fiction all the while, and that they were even publishing collections in English translation to show us decadent imperialists what the stuff should really be like. In 1962, Collier Books reprinted two of these collections in only slightly modified form. "A Visitor from Outer Space"—the Foreign Languages Publishing House title—became "Soviet Science Fiction" (Collier No. AS-279-V) and "The Heart of the Serpent" was reprinted as "More Soviet Science Fiction" (Collier No. AS-295-V). Both had good introductions by Isaac Asimov; neither mentioned the original English-language publication.

Now the New York University Press has published a new selection by Professor Robert Magidoff, Associate Professor of Russian in the university's Department of Romance and Slavic Languages and Literatures. "Russian Science Fiction" gives you eleven stories for \$5.00, compared with seven and five, respectively, for ninety-five cents in the two Collier collections.

I am sorry to have to report, too, that Professor Magidoff's idea of science fiction has produced a pretty dreary book. This may not be entirely his fault—maybe Soviet science fiction is dreary. On the other hand, there were better stories, as stories, in the two Foreign Languages Publishing House (Collier) collections. He may have limited himself to stories which had not been published before in

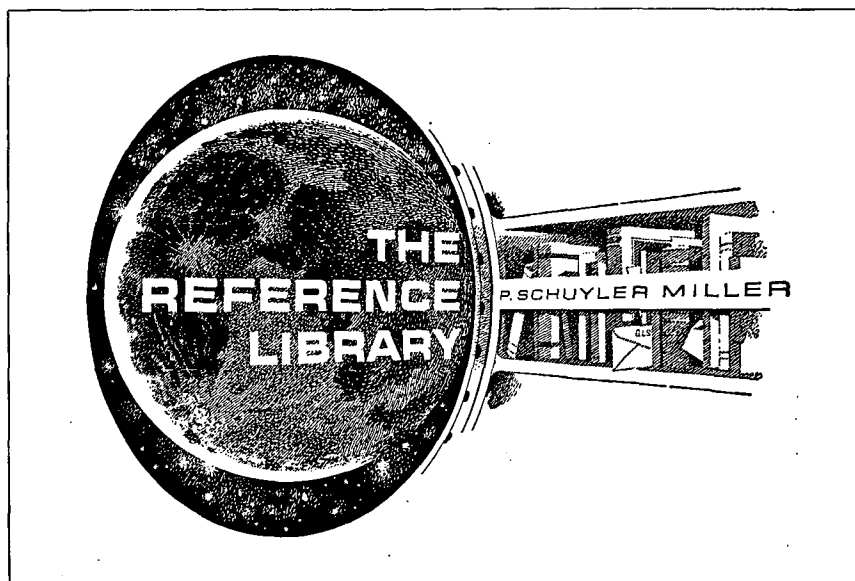
English—yet he reprints Yefremov's "Heart of the Serpent," which is the title story of the second Soviet/Collier collection. Nor is the problem one of translation. Three of the eleven stories are from another English-language collection that I have not seen, "Destination: Amaltheia"; the rest are translated by Doris Johnson, Assistant Professor of Russian at Purdue University. I may have a tin ear, but I can't tell the difference.

My reason for pinning the dullness of "Russian Science Fiction" on its editor, Professor Magidoff, is his admission at the very beginning of his introduction that he equates science fiction with stories of marvelous discoveries and miraculous inventions, plus, of course, visits to and from other worlds. He complains that pre-Soviet stories about other civilizations or life on other planets "were utopias, concentrating on social relationships, rather than science fiction." Novels of this kind go back to Prince Mikhail Shcherbatov's "Land of Ofiriya" in 1783, he tells us. Even as late as 1908, A. Bogdanov's "The Red Star" concentrates on "the social, rather than scientific and technological, aspects of life on Mars," Professor Magidoff complains. I wonder what he'd think of Robert Heinlein's "Stranger in a Strange Land"?

The short introduction, which should be of most importance in a col-

lection that pretends to be scholarly rather than literary, does give some statements about trends as represented by the stories in the collection. This discussion, like the stories themselves, seems to pin down Soviet science fiction at an early-Gernsback level of development, when the purpose was pedagogical and technique meant very little. In this respect, it also means little to the editor, and perhaps to the writers, editors and readers of the original, whether the medium is science fiction or fantasy. Vladimir Dudintsev's "A New Year's Fairy Tale" is a kind of dream-fantasy of relative time and interchanged personalities, and even "On the Moon," by Konstantin Tsiolkovsky, presented in an appendix as a kind of fossil from pre-Soviet days, has its characters breathing and talking in the lunar vacuum at the same time that they are pointing out that it *is* vacuum. The father of Russian rocketry either didn't bother with spacesuits, or the editor or translator saw no reason not to leave them out.

The stories are not dated, but they are placed in the book in what looks like approximate order of age. As I've said, the older stories read like science fiction from the Gernsback magazines of about the same era. In Alexander Belyaev's "Invisible Light," a blind man is wired up to see all electromagnetic fields. In Victor Saporin's



"The Magic Shoes," a biologist produces shoes that can't be worn out. In E. Zelikovich's "A Dangerous Invention," meddlers start up the mad scientist's invention and nearly wreck the Earth—or, anyway, Russia. Vadim Okhotnikov's "The Fiction Machines," in which a would-be writer invents machines to translate his thoughts directly into words, proceeds like a "Doctor Hackensaw" farce in *Electrical Experimenter*. These four stories represent the Russian "classics" in science fiction.

Part Two presents the present-day school of Ivan Yefremov and his contemporaries. "Heart of the Serpent" you should know from the Collier books: it is an attack on Murray Leinster's "First Contact"—published here in 1945—built on the premise that any life form advanced to build a starship must be human and must be communist, even though they have a fluorine metabolism. The problem of distrust on which "First Contact" was based never arises—but at the end, the fluorine people are to be changed to make them "really" human.

Yefremov, a paleontologist, draws on his central Asian field work for the background of "Shadows of the Past," in which a device a little like that in John Taine's "In the Beginning" makes it possible to see past eras. Mikhail Vasilyev's "Flying Flowers", also in good Early Gernsback style, involves a prospecting trip into Soviet Asia, an ancient legend, a beautiful student, some remarkable butterflies, and a resourceful hero.

Closest to the kind of science fiction we know here in Analog is Anatoly Dnieprov's "The Maxwell Equations." The author is a physicist who also writes science fiction, in the good world-wide tradition, and his language in this story rings true. It has the interesting theme that a human being is still far more complex than a computer, and can beat a computer at its own trade if certain limitations are overcome. The setting, incidentally, seems to be German. Modern in theme, too, is Valentina Zhuravleva's "The Astronaut," a simple story of sacrifice

on an interstellar expedition.

Until somebody really gleans the body of Russian science fiction, your best bet is still the pair of Collier reprints.

THE HUGO NOMINEES

As this is written, the 22nd World Science Fiction Convention and the "Hugo" awards for the best science fiction/fantasy of 1963 are still three months in the future. I can, however, thanks to the up-to-the-minute reporters of *Science Fiction Review*, give you the names of the nominees. If you are a Convention member, you will have your chance to vote for your choice.

Analog is again on what the British call—logically enough—the "short list" for best professional magazine. Competitors are *Amazing*, *Fantasy and Science Fiction*, *Galaxy*, and the *British Science Fantasy*.

An Analog serial, Frank Herbert's "Dune World," and a novelette, Rick Raphael's "Code Three," are also among the finalists for the two best fiction awards. Paperback publication before the convention, if it occurs, may help the Herbert novel win over the probable favorite, Robert A. Heinlein's "Glory Road"; the other contenders are Clifford D. Simak's "Way Station" and Andre Norton's "Witch World." Miss Norton is long overdue for this kind of recognition. Contenders for best short fiction are Poul Anderson with "No Truce With Kings"—also in his *Time and Stars* collection—Roger Zelazny's "A Rose for Ecclesiastes" from *F&SF*, and Edgar Rice Burroughs' "Savage Pellucidar" from the posthumous book, paperback and *Amazing*. (I should have credited *F&SF* with the original publication of the Heinlein novel in a shorter version and the Anderson story, and *Galaxy* for the Simak novel, which was a hardback later.)

Analog's cover artist, John Schoenherr, is also fighting it out with Ed Emshwiler, Virgil Finlay, Frank Frazetta and Roy Krenkel for best professional artist of '63.

The dearth of good TV programs in the SF field, and the decision *not* to

give the award to a series *per se*, has probably scattered the nominations so thoroughly that there will be no drama award. This is unfortunate in a year that produced "The Haunting," one of the most intelligently produced, directed and acted films of the supernatural we have had. British fans have spoken well of "The Day of the Trifids," too, but it hasn't been well distributed here in the United States. Don't fans go to the movies any more?

This year there will, for the first time, be a Hugo for the book publisher who has contributed most to science fiction and fantasy during the year. Doubleday is in there for its consistently good hardbacks and, I suppose, its book club. The other contenders are paperback publishers: Ace, Ballantine and Pyramid. This one is a horse race!

There are four finalists in the competition for best amateur publication of 1963—a category that only occasionally disturbs us here. The nominees are George Scithers' *Amra*, a handsome, freewheeling and often scholarly publication devoted to the sword-and-sorcery genre; Camille Cazedessus' *ERB-dom*, one of the best of the Burroughs fan journals and also handsome, scholarly, but more serious than freewheeling; and two "real" fanzines, Ron Ellik's *Starspinkle* and Robert and Juanita Coulson's *Yandro*. I have no intention of trying to characterize these, except to say that *Yandro* is one of the oldest if not the oldest consistently superior publications of its kind.

THE TIME MACHINE & THE WAR OF THE WORLDS

By H. G. Wells • Heritage Press, New York • 1964 • 98 + 188 pp. \$6.50

There really are a few legitimate reasons for giving space to yet another Wells reprint. This is a handsome Heritage Club edition, lavishly illustrated in color and black-and-white by Joe Mugnaini, who has illustrated several Ray Bradbury books. I like his black-and-white work better than his color, but the result is a handsome library edition, printed in "flip" format like an Ace Double paperback.

Each half has a short introduction by J. B. Priestley which you should find interesting. Priestley deplores the fact that Wells never accepted the value and importance of his science fiction, but saw himself as a great social thinker and teacher. Priestley grants him his importance as a teacher, but regrets the loss of the imagination that produced such stories as these. This war of opposites, he points out in his introduction to "The War of the Worlds," can be seen working behind the scenes in that other classic. He suggests, incidentally, that the hurried ending may have been the result of writing to a set length for the 1897 serialization in *Pearson's Magazine*.

Here is a really fine gift for yourself or a friend.

ADDING A DIMENSION

By Isaac Asimov • Doubleday & Co., Garden City, N.Y. • 1964 • 202 pp. • \$3.95

It has only just dawned on me that by using seventeen of his essays from *Fantasy and Science Fiction* in each of these reprint collections, the noted teranumerologist, Dr. Isaac Asimov, is each time giving us a prime number of prime articles on science, mathematics or what have you. But why couldn't it be nineteen, or twenty-three?

This particular collection—the third from his *F&SF* department—is unified by a historical approach. Most of the essay-articles show how certain present concepts in science and mathematics evolved, whether the compass-and-straightedge convention of the Greek geometers to the naming of chemical compounds from misunderstood mispronounced Arabic terms.

As always, the author is impressed by large numbers and delights in showing his ability to juggle them and—if it doesn't strain the metaphor beyond probability—make patterns with them in the process. No matter whether you are a mathematician, physicist, chemist, astronomer, biologist or general, you'll find something fresh about the point of view with which familiar subjects are presented. And if you're just an unedicated nobody, you should be fascinated, just

as you are by the articles in the Sunday papers. Only *these* you can believe . . .

THE BEST FROM FANTASY AND SCIENCE FICTION

Edited by Avram Davidson • Doubleday & Co., • Garden City, N.Y. • 1964 • 255 pp. • \$4.50

This thirteenth collection from our contemporary, *F&SF*, really *is* the best in some time. Unless you can't stand fantasy and the supernatural, which makes up a goodly part of the book as the magazine, you're doing yourself a disservice to miss it. There are, incidentally, thirteen stories.

Let's take the "real" science fiction first, then the border-liners, and sketch in the fantasy last. Don White, in "Peggy and Peter Go to the Moon," has a devastating parody of the standard grade-school reader format with a wholly adult ending. Harry Harrison, in, "Captain Honario Harpplayer, R.N." has an even more devastating—because more developed—parody of one famous series of historical adventure stories. But Richard McKenna, author both of the classic "Casey Agonistes" and the best-selling novel of the Navy in China, "The Sand Pebbles," is very very serious in "Hunter, Come Home," with its picture of the way custom can warp reason on the worlds of space as on our own. Alfred Bester is serious in his depiction of the inner struggles of two of the last people in the world, as they meet in New York in "They Don't Make Life Like They Used To." Zenna Henderson is as always concerned with the close relationships among people—her "People"—in "Deluge," the story of how and why the People left their Home to come, among other places, to Earth.

"What Strange Skies and Stars," by author/editor Davidson, is both parody and pastiche. It utilizes the author's ability to evoke the past in its own terms, yet pushes a little over the edge of ridicule to show us what happens when a starship uses a press-gang to pick up a crew in Victorian London. Finally, Ray Nelson's "Eight O'Clock in the Morning" is a thoroughly outrageous yarn on the

"we are property" theme.

If you believe that the Greek myths recall a time when there were centaurs and other marvels on Earth, Karen Anderson's wonderful little "Treaty in Tartessos" is science fiction. If you don't, it's one of a series that is as close as anyone has come to Lord Dunsany's "Tales of Wonder"—yet as different as dry sherry from muscatel. Some day these stories will require an artist just a little more sophisticated than Sime to illustrate their collection in a book.

I don't believe in ancient monsters that can change ships to gold, so P.M. Hubbard's "The Golden Brick" is a story of the supernatural. I don't believe that a man can remember the time when a Cretaceous sea rolled over England, so I guess J. G. Ballard's haunting "Now Wakes the Sea" is fantasy, too. I don't think Jack Vance intends me to believe in the magics of various colors that we encounter in "Green Magic"—just to enjoy. I refuse to believe in the antics of "McNamara's Fish" as Ron Goulart describes them. But I can't help wanting to search the Peruvian *puna* for that "Niña Sol" to whom Felix Marti-Ibanez leads us in the story of the same name.

This one really lives up to its title.

TIME OF THE GREAT FREEZE

By Robert Silverberg • Holt, Rinehart, & Winston, New York • 1964 • 192 pp. • \$3.50

Some time ago I belabored Bob Silverberg for "writing down" too far in his previous juvenile science fiction, "Lost Race of Mars." This time he's right on the beam for the twelve to sixteen year group for whom the former Winston series was intended, but I have a new gripe. Either he has been careless with detail, which is not like him, or he hasn't written down enough.

This is a story of 2650 A.D., when the great cities of the northern hemisphere have been buried in underground refuges for three hundred years while the ice of another glacial era covers their former sites. Now the ice is beginning to go, and a group

in New York have made radio contact with London. Accused of treason and driven out of the city for disturbing the *status quo*, they set out across the ice for London, three thousand miles away. They encounter men who have adapted to the ice, and reach their destination only to find themselves under attack as invader scouts. This is by no means Heinlein or Norton grade juvenile SF, but it is better than much in the poorer paperbacks.

Now for my gripe—things which the author should have taken special pains to have straight for a juvenile audience. By not explaining them away, the author has left the impression that he wrote carelessly.

Three hundred years is too short a time for a planetary ice cap to have developed and started to recede, but that *has* been explained away by using the old cosmic dust theory to account for the cold. It is far too short a time, even if the author had bothered to evoke mutation as a result of secondary cosmic rays from the dust cloud, for moose to change from a forest-living animal that browses on twigs and pond lilies into an ice-wanderer that lives on algae licked off the top of the snow. (That last sounds like somebody's tall story about caribou or reindeer.) Contrarily, in the sixty years since the escape tube above New York was last used, ice movement would have crumpled it beyond recognition.

On the other hand, the graded series of savage societies on the ice is quite good, from the folk along the sea who have lived best and changed least to the Eskimo-like savages deep inland, barely keeping themselves alive with little energy to spare for an elaborate culture. Three hundred years would probably be too short a time for so great a change, but maybe it wouldn't.

If only Bob had gone around to the Bronx Zoo to look at those moose before he used them!

12 GREAT CLASSICS OF SCIENCE FICTION

Edited by Groff Conklin • Gold Medal Books, Greenwich, Conn. • 1963 • No. d1366 • 192 pp. • 50¢

Classics these stories are not, but a publisher can be allowed a little hyperbole when you know his editor isn't given to it. "Undiscovered" they're not either, in spite of the cover blurb: Robert Sheckley's "Human Man's Burden" has been reprinted at least once before, and Fredric Brown's "Earthmen Bearing Gifts" is in the latest *Galaxy* anthology—doubtless assembled after Groff Conklin put this one together. However, this dozen stories—two of them from Astounding—do provide an excellent sample of the field of 1956-1963 vintage. Only one—one of the best—goes back to *Story* of 1953.

The selections from Astounding open and close the book. Algis Budrys' "Due Process" is a vigorous example of Big Business operation in a future society, and J. T. McIntosh's "Immortality . . . for Some," one of the best in the book, goes beyond its plot in its evocation of human values.

Zenna Henderson's "Things" is, I think, my favorite. Its aliens have their own heritage, their own values, yet they are open to the corruption by things that destroyed the American Indian and may destroy Africa. "The Top," by George Sumner Albee, the story from *Story*, is a kind of allegory of the modern status pyramid, very understated. Cordwainer Smith's "The Ballad of Lost C'Mell" is one of his present series of stories about the underpeople, the animal-men created as slaves of "real" men by a kind of future extension of the processes Dr. Moreau used. I felt I knew C'mell better when I met her in "Alpha Ralph Boulevard." This story reads like a connecting bit, but the Smith trademark of stupendous concepts gently suggested is still there.

The other stories are lighter. Poul Anderson, in "My Object All Sublime," has a twist-at-the-end story about penology and time travel. Brown's story is its twist. Sheckley's is the one about the mail-order bride for an asteroid miner, and the faithful old robot slave. J. F. Bone's "On the Fourth Planet" describes, from the Martian point of view, what may happen when one of our life-sampling probes lands. Robert F. Young's

"Thirty Days Hath September" is a sentimental, almost Bradburian story about the man who had gone to real-school and bought a schoolteacher for his son. Bertram Chandler's "The Cage" is a wry little yarn about the castaways on a far planet who wound up in an alien zoo, and how they proved their humanity. And William W. Stuart's "Star-Crossed Lover" is a wild farce of miscegenation on a cosmic scale.

THE ETERNAL SAVAGE

By Edgar Rice Burroughs • Ace Books, New York • No. F-234 • 1963 • 192 pp. • 40¢

This report is made primarily as a record of what the story—"The Eternal Lover" in its previous editions—is not. When Burroughs wrote the first part, published in *All-Story Weekly* in 1914, he evidently intended to bring a cave man of a hundred thousand years ago down to present-day Africa, to cope with the modern world—perhaps even to compete with Tarzan, on whose ranch Nu of the "Niocene" wakes after being entombed by an earthquake. There would be the question whether a girl of 1914—even though she was the reincarnation of Nu's Niocene sweetheart—could accept the love of a noble savage who, nevertheless, did not have Lord Greystoke's English parentage and inherited title.

In the four-part sequel which completes the book, the author did an about-face. Nu and Nat-ul are back in the Niocene, but it is a flashback rather than time travel, and Nat-ul is not Victoria Custer. In the end the whole thing is passed off as a dream or hallucination.

It is interesting, however, to compare Burroughs' ideas of early man with those Jack London depicted at about the same time in "Before Adam." Both men accepted the idea that the first men were tree-dwellers—in fact, Tarzan is returning to Man's first home when he joins the apes in the treetops. Both men showed people in the successive stages of social evolution living side by side in the primitive world—something which certainly did happen, in the technological sense at

least, though not with the span both writers show, from a Lower Paleolithic to a Neolithic level. Burroughs went on to develop the idea to its ultimate in "The Land That Time Forgot," by having individuals pass through the whole gamut of evolutionary forms; he also, as have many others since, allowed dinosaurs and their marine equivalents to survive as contemporaries of early Man. But in my own grade-school days, a decade later, the "Book of Knowledge" had a grand illustration of the brontosaurus that was supposed to still exist in Central African swamps.

X

By Eunice Sudak • Lancer Books, New York • No. 70-052. • 1963 • 126 pp. • 40¢

Long, long ago—it must have been about 1920—I saw one or two episodes of an old silent serial called "The Midnight Man." Its hero was a Mandrake-style magician who could levitate, walk through walls, and perform other feats of magic. I *think* he could also see through solid objects.

A few years ago Hollywood resurrected this gimmick for one of the first of the nudie films, "The Immoral Mr. Teas." When the gentleman (*sic*) in question had drops in his eyes, female-type clothing seemed to disappear.

Now it's back again in a Ray Milland mad-scientist horror epic in Pathecolor. The paperback noted here is by Miss Sudak from the screenplay by Robert Dillon and Ray Russell from a story by Ray Russell. The movie may be good of its kind, but the book is strictly formula. Great Scientist makes Great Discovery—eye-drops that let him see through things, including the heroine's clothes. The Foundation that has been paying for all this rejects him, but he goes ahead with himself as guinea pig. In a fit of being severely misunderstood, he kills his best friend. He hides out in a carnival, is blackmailed, etcetera. All the while his eyes bug out and shine in Pathecolor.

The author thinks a centimeter is a measure of volume. The writer for the

back cover blurb, astonishingly, knows it's a "cc".

THE DAY THE WORLD DIED

By John E. Muller • Vega Books, Clovis, California • No. VSF-3 • 1963 • 137 pp. • 50¢

I stumble upon these offerings in the "Vega Science Fiction Library" more or less accidentally, and report on them out of grim duty. They are apparently U.S. reprints of British paperbacks, but of a grade that we only rarely get here in some of the sex-and-SF "originals". Not that they are sex-crammed; they are, on the whole, what you would expect if a college freshman or a high-school senior tried to convert one of the tiredest Hollywood monster films into a "novel."

This time, monsters from space accidentally or on purpose set off a nuclear war between Reds and West, then move in to glower and mop up. The hero, for novelty's sake, is Russian—a noble rebel against Communist tyranny who was about to be sent up in a lead space capsule and cooked with cosmic rays, when the first bomb fell. He escapes from the capsule, makes the trip from Siberia to Moscow seem like a morning's commuting in Pittsburgh or New York, and finds a cadre of survivors—including, of course, his family—who trek to the North Pole to join forces with an American colony. Meanwhile Carl Novak has discovered that the monsters from space react to his flute playing the way the Moscow critics used to. If it is ever filmed—and it's ready-made for a really lousy movie—the noise of that final battle of the flutes and whistles ought to clear the theater and the neighborhood!

F.S.C.

By Con Sellers • Novel Books, Chicago, Illinois • No. 6081 • 1963 • 128 pp. • 60¢

The three initials which constitute the title of this original paperback stand for "Federal Sex Commission." This will suggest its theme and approach—but it's better done than you'd expect. Unfortunately, Mr. Sellers can

probably make more money writing this kind of paperback than if he used his talents on "straight" science fiction with the same theme.

This is the one about the handsome, muscular, educated barbarian who has been hiding out in the mountains while America goes to hell. The extreme right and extreme left have joined forces to take over the country, and have hewn out a highly unpleasant totalitarian society along lines that will be familiar to most readers of science fiction. At the top are the 'in's' and would-be in's, engaged in a power struggle, living luxuriously off the nobodies. The "Inalis"—who harbor antiquated illusions about "inalienable rights"—are starved masses in the slums of the undercities. The Creepers are half-bestial, grubbing tribes living off the land as best they can, descended from the physical and mental defectives thrown out by the cities.

John Adams comes down out of his mountains to get him a wife and bursts all this wide open. An assortment of vicious characters, male and female, hunt him through the city. Power plays are whipped up around him; orgies planned with him as the star stud. Naturally, he resists all this and makes a better future seem possible. A future, presumably, with no place for this kind of fiction.

RADAR ALERT

By Karl Zeigfreid • Vega Books, Clovis, California • No. VSF-4 • 134 pp. • 50¢

Another in the series of paperback reprints of very minor English paperbacks. There are far better stories in the back files of *New Worlds* and *Science-Fantasy* that we have never seen over here, so why give us this stuff?

Of course, the basic idea was good enough for television in a widely acclaimed curtain-raiser for the "Outer Limits" series. Something comes out of a radar set and possesses its operator. From there on, things get rough, though it is never clear what the extraterrestrial monster hopes to accomplish. Just on vacation, maybe, poor devil.

of tribal social relationships that normally appear not to go much beyond the family or clustered homestead level. This is supposedly the case, at least, until some danger strikes, whereupon proximus groups expediently unite under the commonly perceived need for mutual defense.

Interestingly, current theory holds that the extent of populational unification for defense is always "somehow" proportionate to the extent of the threat. Thus the "theory" explains nothing but constitutes a teleological statement of social cause and effect, derived from imperfect observation of the true extent and functionings of the social structure, and from a convenient disregard for the highly homogeneous cultural background of the society's spatially separate—but historically intercommunicating—persons and groups.

But all this, while it has real bearing on several glaring inconsistencies and improbabilities in Mr. Anderson's story, doesn't subtract a whit from his imaginative use of existing anthropological data and theory as a starting point for improvisation. That the theory is controversial or wrong—in this case both—is lamentable, but mostly in an academic sense.

ARTHUR M. HARKINS

Department of Anthropology,
University of Kansas,
Lawrence, Kansas

Such a society in which the local groups did NOT co-operate in "sufficient" degree to meet external threats were, of course, destroyed by the inadequately opposed threat. Therefore we observe only those which did—and "observe" a law of adequate co-operation?

Dear Mr. Campbell:

Thanks for an especially entertaining issue of Analog for July.

It is astounding how poorly seemingly intelligent individuals read. The letters you received anent your editorial: "God Isn't Democratic" point this up. Your editorial was in no way

to be interpreted as a theological treatise by any understanding reader. It certainly did point up the fallacy of thinking, "*vox populi, vox Dei*"—or, if the majority is for it—"it's right!"

Whether or not there is a God and creator there is certainly one thing certain. If there is not a creative first source which had a purpose in creating—if it is all the result of a fabulous accident which has *no* purpose—then consciousness is equally accidental and lacking purpose, and the intentions and purposes of any conscious entity are equally meaningless and utterly absurd. Consciousness, *per se*, when there was no purpose for its being, cannot—logically, reasonably nor intelligently—suddenly force meaning and purpose into its self-willed intentions. Ergo—if one affirms that one is an atheist one should carry the position to its ultimate and do absolutely nothing with conscious intention—for both consciousness and intention are futile and without meaning or purpose. Such a position may be a valid one—who proves the whole show isn't an accident?—but it certainly reduces the whole show including man and every facet of his nature his arts, crafts, curiosity, inventiveness and all to a meaninglessness and vacuity which is, to say the least, demeaning.

FRED SCHUYLER

916 Fourth St. S.W.,
Albuquerque, New Mexico

Item: Anything whatever that can be done, or happens, must be something the nature of the Universe itself includes as part of its structure. Consciousness exists. Ergo: ... ?

Dear Mr. Campbell:

Mr. Burkett's story in the July Analog was worthy indeed of all the praise you gave it. The story did seem to lag a bit in the dialogue, but this was overshadowed by the excellent story plot, and the masterful descriptive writing presented. I find it hard to believe that this is Burkett's first time out. If the next two installments are as good, I'm sure the novel will have no trouble finding its way into hard covers.

"The Master Key" also, can be

rated as a top-notch story, but then I have come to expect that from Poul Anderson. The plot line seemed a little worn, but the situation proved unusual and original, as it usually is in an Anderson story.

The piece by Phillips was unusually clever, and somewhat reminiscent of a vignette. The other short story, "The Sea-Water Papers," also was clever, even though I had the gimmick figured out long before I reached the story's end.

I must say that I enjoy your magazine more than any other sf publication, however your letter column is usually very disappointing. I am convinced that Analog should be a science-fiction magazine first and a fact magazine second. Evidently you do not feel this way, as you run the fact articles first and foremost. Even on the cover, you call your magazine "science fact" before "science fiction." However, I do feel that you should give Brass Tacks more over to discussions on the stories, and let the scientists write to *Scientific American* or some such publication.

JIM ARMSTRONG

5335 Holland

Arvada, Colorado

Doubleday has already arranged to bring out "Sleeping Planet"—and it is Burkett's first time out. It is NOT a pen name.

Dear Mr. Campbell:

A. F. Whitlock's letter in the July issue, combined with my own knowledge of Fred Hoyle's theoretical work after the famous steady-state theory, prompts me to suggest that an article by or about Mr. Hoyle would be a good idea. Since the adoption of ASF's new format the quality of the science articles has improved rapidly, and I am no longer reluctant to show Analog to friends who equate Science Fiction with Rosicrucians and Boris Karloff. The Dawson/Bova solar-system article was an answer to your prayer of over a year ago for a replacement for Jeans and Eddington. An article on Hoyle and Narlikar would be the answer to mine.

Poul Anderson's story "Un-Man"

was published, I believe, in *Astounding* in 1953. One of Mr. Anderson's tales of the aftermath of World War III, it developed the idea of zygotes produced in some way from undifferentiated tissue of one man, and thus the idea of duplication of such a man, in this case a "Renaissance man" with the qualities needed in a shattered world. It was an exciting story, but seems to me to require a re-examination. If possible, I'd like Mr. Anderson's comments on the relative effect of heredity and environment, and on whether he still thinks that men raised half a world apart, even when they have identical chromosomes, can have, as one of the story's characters put it, "the same soul."

For the An Lab (July)—"Sleeping Planet" is a welcome change after the stories which portray alien races as either too similar or too dissimilar for this sort of war. The "Semper Vigilans" cover is a rather bad joke, though. Give "Throop" a fifty per cent success rating. "The Master Key" was interesting, though the first person idea doesn't quite appeal to me, come to think of it, I don't think I've ever read a P.A. story in first person before. (When will we see a collection of the Van Rijn tales?) As for the "Sea-Water Papers," it is impossible for me to understand how it got in, or is this some of that "Science Fiction for the non-fan" I've heard about? The Van Rijn collection idea suggests yet another to me. When will there be a collection of Analog science articles?

Collection or no, keep up the good works.

GEORGE W. PARTLOW

Hotel Wm. Baker
Chautaugua, New York

Doubleday is already at work on a Van Rijn collection.

Dear Mr. Campbell:

The cover of the July Analog made me remember an odd story. After K Day, many jobs were filled by new, inexperienced men.

A young man was employed at an ordnance plant. For some reason of his own, he wished to determine the boil-

ing point of nitroglycerin.

A flask with a thermometer was partially filled with N.G., and a Bunsen burner was lighted to heat the material. Fortunately, some of the other men stopped the experiment and there was no explosion.

We all respect Edison's maxim—"try anything once," but there are some limitations even to this.

R. E. BOWMAN

4309 Fordham Road,
Baltimore 29, Maryland 21229

And this proves chemistry is so dangerous we should forbid experimentation?

Dear Mr. Campbell:

For the An Lab—July issue:

1. "The Master Key," Poul Anderson. And when will he put out a book of the Van Rijn stories?
2. "A Day in the Life of Kelvin Throop." Too true!
3. "Sleeping Planet"
4. "The Sea Water Papers."

On "Sleeping Planet," the details are full of suspense, but the point is telegraphed: Grandpa's ghost is brought in for more than a good psychological-warfare story; Eric Frank Russell polished off that fifteen years ago, in your magazine. But a look at the list of vapor-immunes: Rayburn father and son, Rierson uncle and nephew, Nogales mother and son or brother and sister, makes it clear the immunity is hereditary. Through Rumjet Donovan? Obviously. Bradford Donovan's immunity to the vapor and to authority comes from Rumjet. Second-guessing the author is always fun; keep up the good work.

PATRICIA SHAW

#2 El Paseo Apartments
Las Cruces, New Mexico

Eric Frank Russell didn't do it with robots!

Dear Mr. Campbell:

I first discovered your magazine about nine months ago, and I was immediately taken with all of its departments, especially with the editorial and the letter section. Both have a free-wheeling quality to them that I haven't found in any other magazine. Accord-

ingly, I have decided to add my two cents worth.

I was extremely interested in the article in the July Analog on the origins of the solar system. Astronomy has been a sort of armchair hobby with me for over ten years, and I fancy myself as having a little idea of what constitutes a plausible theory in this area. This new theory certainly explains some things that had been bothering me. But there still are some things about it that bother me.

The first is kind of minor, but I think it still is relevant. I can't see any flaw in the fact that no planet-building is observed in the gas shells surrounding ancient novae. There is quite a difference between a spherical cloud of gas blown outward by a dying star and a more or less disk-shaped cloud given off by a proto-star. In fact, I would be quite surprised if signs of planet-building were observed in a planetary nebula. The dust-cloud hypothesis postulates a rotating cloud, and I don't remember reading anything about planetary nebulae that mentioned rotation.

My second objection to the article is, in my opinion, more serious. I have always been suspicious of any theory of the evolution of the solar system that did not account for the fact that the major planets all revolve in approximately the same plane in orbits of very low eccentricity—excluding Pluto, of course, which is probably a special case. It is easy enough to explain the odd axial inclination of Uranus by supposing it to be a fragment of the embryo star that was ejected with that unusual spin. It is harder to explain why such an unusual fragment took up such a circular orbit—second only to Venus, if I remember correctly. As far as that goes, the axial inclinations of most of the planets are grouped somewhere around 25°. It seems kind of funny that all of those fragments had so nearly the same spin orientation.

This is not to say that I agree entirely with the dust-cloud hypothesis. Some cogent arguments against it were presented in the article, of course, but I have a few more. For instance, if the

sun were formed as part of a star-cluster, wouldn't the gravitational influences of the surrounding protostars tend to disrupt the embryo solar system? I present that as a question, because I don't know how compact those clusters are supposed to be, and I could easily be wrong there. But I think my other objection is probably more valid. If I have my facts straight, the comets are supposed to be the remnants of the gas disk from which the planets evolved. Yet when these comets make their perihelion approaches, they come in from all directions, not just from the ecliptic, where they would be expected if they were remnants of the planet-forming process.

I realize that this is all destructive criticism; unfortunately, I don't have any theories of my own to explain the formation of all the various features of the solar system. As was pointed out, the amazing thing is that people still try!

The analytical laboratory puzzled me for the first few issues until it was explained in the January issue. My choices for the July issue are:

1. "The Master Key," by Poul Anderson. I think Poul Anderson is about the most consistently good writer of science fiction that I have read. I don't mean literary quality; I'm no literary critic so I can't give any valid comment here. What I mean is that I generally don't put down one of Anderson's stories until I have finished it. Orchids, too, to John Schoenherr for his illustration of the "Noble Savage."

2. "Sleeping Planet," by William Burkett, Jr. This story would have taken #1 in any other issue except this one. Grandpa's ghost kind of reminds me of a similar being named "Eustace" in a story called "Plus X" that I read a couple of years ago. Come to think of it, I believe Poul Anderson wrote it.

3. "A Day in the Life of Kelvin Throop," by R. A. J. Phillips. Our family spent three years in Alaska several years ago, so I got a big charge

out of Mr. Throop's views on Arctic life. I hope he turns up again.

4. "The Sea-Water Papers," by Raymond E. Banks. I think I would have enjoyed this story more if I hadn't read the whole idea to the story as a "springboard for discussion" in another science-fiction magazine.

I certainly enjoy this magazine. It's getting to be where I read *Analog* right behind *Scientific American* and *Sky and Telescope*. For a while I had trouble finding it in this backwater of civilization where I live, but lately the magazine stands have started carrying it. I am starting college next fall, and one of my first actions there will be to start a subscription.

Keep up the good work.

JOHN WALTERS

2570 E. McElvaney Drive,
Merced, California 95340

Answers: 1. A planetary nebular is not at all the same thing as the gas-dust cloud under discussion; the latter, like that in Orion and Taurus, are scores of light-years across, not light-hours!

2. When first ablated from the intruding proto-star, the planetary cores would have highly eccentric orbits, but all would lie very near the plane of the orbit of the intruder. Both eccentricity and orbital angle would be subsequently very heavily damped by friction with the gas-dust cloud surrounding the Sun.

Comets, on the other hand, need not be ablation from the intruder, and comets seldom survive more than one hundred years. Their years, that is! Like the fabled pitcher, too many trips to the Sun's gravity well, and they are broken up. Hence their orbits aren't damped.

3. Other proto-stars in the formation-cloud would tend to be light-months distant; their tidal effects on the forming Solar System would be minute compared to the grip of the Sun, only light-hours away.

4. Some of our readers in somewhat more inaccessible places than Merced—Afghanistan, Bangkok, Nairobi—have discovered we offer subscriptions, and by-pass the irregularities of local newsstands.

Dear Mr. Campbell:

"Relativity Episode No. 1," by Philip Hawley, August 1964 ASF: You have an intriguing problem here. If we ignore the anomaly of day and night when all the light from the observer's sun is cut off, and assume that the shaft lies within one light-day of each observer so that effects can be noted within the time limit, some technical problems remain.

An observer sitting virtually on top of the shaft can hardly sight down its length and measure relativistic contraction. The extreme angle of vision would foreshorten formidably. And he can not, in one day, observe effects at the far end of a shaft several light-years long.

But these are merely quibbles; the question is not how well he sees the shaft, but whether he will be in sunlight, yes or no. I hope some reader with a proper command of theory offers an authoritative reply; but my guess is that each observer would find a shaft 1.1 light-years in length between himself and the stars, blocking off the light. Observer #3 may see something else entirely—twenty-five years later when the matter comes to his attention. He may rationalize that the shaft, 1.1 light-years long, can not simultaneously cover #1 and #2; but practice speaks louder than theory, and who will pay attention to someone twenty-five years behind the times?

PIER JACOB

800 75th Street North

St. Petersburg, Florida 33710

This may be a leeeetle hard to practice.

Dear Sir:

I think the answer to Philip Hawley's ingenious Relativity Episode No. 1 is that the sun rises for Observer One in 1.1 years; for Observer Two in 12.1 years.

It is true that if relativity is sound, the apparent length of the steel rod is now one tenth of its rest length, if measured by radiant or reflected light, by an observer at rest. However, this is a case of interception of light, no measurement is involved and only the rest-length is relevant.

Sometimes relativity reminds me of

psychoanalysis. It's a pretty theory but the experimental evidence is still scant.

A moving electron indicates a mass increase to an observer relatively at rest. How do you measure, directly, the mass of a moving electron? Does somebody run around inside the beta-tron with a spring balance?

While I'm on the subject, let me raise an eyebrow at a couple of other

matters: One: the old chestnut about the spacemen living more slowly near the velocity of light. I think this is nonsense even by relativity.

True, if watched somehow by an observer relatively at rest, processes on the ship will seem to be slowed, if viewed by light. This follows from the assumption that the velocity of light is constant for all observers, et cetera.

But *elapsed* time is not affected. If the ship is away ten years, on their return the spacemen will find everybody ten years older, including themselves.

Second: light velocity as an upper limit. I think it is—for light. The velocity of sound is also a constant. Its local limit is Mach 1. What has this to do with flying in the atmosphere? Nothing, except for the heating effect when the jet pilot exceeds the local Mach 1. What will limit the velocity reached by a spaceship under constant acceleration? Just the resistance of gas in space, stray magnetic fields and similar physical drag forces.

I have to admit this raises an interesting puzzle. How would a ship traveling (say) at twice light velocity register on the instruments of an observer relatively at rest? Well, what is the electromagnetic equivalent of the sonic boom? I don't know but I suspect it would fuse TV antennas for miles around.

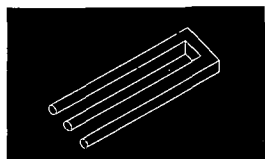
According to relativity, of course, the ship's mass—to our stationary observer—became infinite as soon as the ship touched Cee. But according to the ship's frame of reference, all you have to do to go faster indefinitely is to throw on more coal. My money is on the ship.

A. B. MACFADYEN

134 Lawton Blvd.,
Toronto 7, Canada
Relativity Episode #2: The first light-speed ship was built, and the crew was trained, and all was ready for the first interstellar trip. On the day before take-off, unfortunately John R. Phizzist, who'd labored all his post-graduate life on its construction and crew-training, was killed in a minor accident on board. Inevitably, his ghost haunted the Ceespeed One when it tookoff; too much of his soul had gone into its creation.

Now as everyone knows, ghosts are not composed of electromagnetic matter, and do not have electromagnetic senses; they're structures of pure ectoplasm. And as a consequence, of course, ghosts aren't affected by the Einsteinian relativistic distortions.

What did the ghost observe as the ship reached 99.999+% of c ?



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May 14, 1964

Mr. John W. Campbell
Editor
Analog Magazine
Editorial and Advertising Office
420 Lexington Avenue
New York, New York

Dear Mr. Campbell:

In respect to page twenty-seven of your June, 1964 issue, we submit this bit of information that might be of interest to you and your readers.

While a student in grade school some twenty years ago, I saw for the very first time, in my old red mathematics book, a drawing such as that shown in the upper left-hand corner of this letter, and very much like that in your publication.

In 1952 when we started business, this design was undertaken to serve as a logo. We have used it on our letterhead, on the back of business cards (see enclosed), and on the automobiles we use as you can see on close inspection of the attached photograph.

In the field of higher mathematics, this model is known as a Two-Slot, Mark 4, Blivit—origin unknown—and during the past ten years has gotten into the hands of many organizations through our business dealing with them. It was suggested by my grade school teacher that the late Doctor Einstein was the designer of this model, and did so as a joke to a close friend in the engineering field.

I hope this information will be of some assistance. You are welcome to publish my letter. We pick up your magazine every time it is available at our local news-stand and enjoy it a great deal for the content it offers.

Yours very truly,

INDUSTRIAL CAMERA
James E. Rinnell
James E. Rinnell

1111 - 11th. Street
Oakland, California

It's impossible to publish even a small fraction of the letters that outrageous piece of draftmanship evoked. There were well over one hundred fifty letters on that one item alone—and while we have long been aware of the unusually high level of intelligence of Analog's readership, the high level of honesty was a new and pleasant discovery. Not one of all those letters claimed to be the original contributor, or demanded the ten dollars!

Instead, they called my attention to many sources. The thing appeared recently in Road & Track magazine, QST, The SAE Journal, various and sundry house organs, and in various textbooks on topology—it seems it's called a "blivit" by some—and on psychology—perceptive illusion department. However we do reproduce herewith the letter of one outfit that has some claim on the thing; they've been using it as a symbol for ten years.

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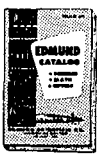
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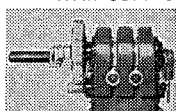
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